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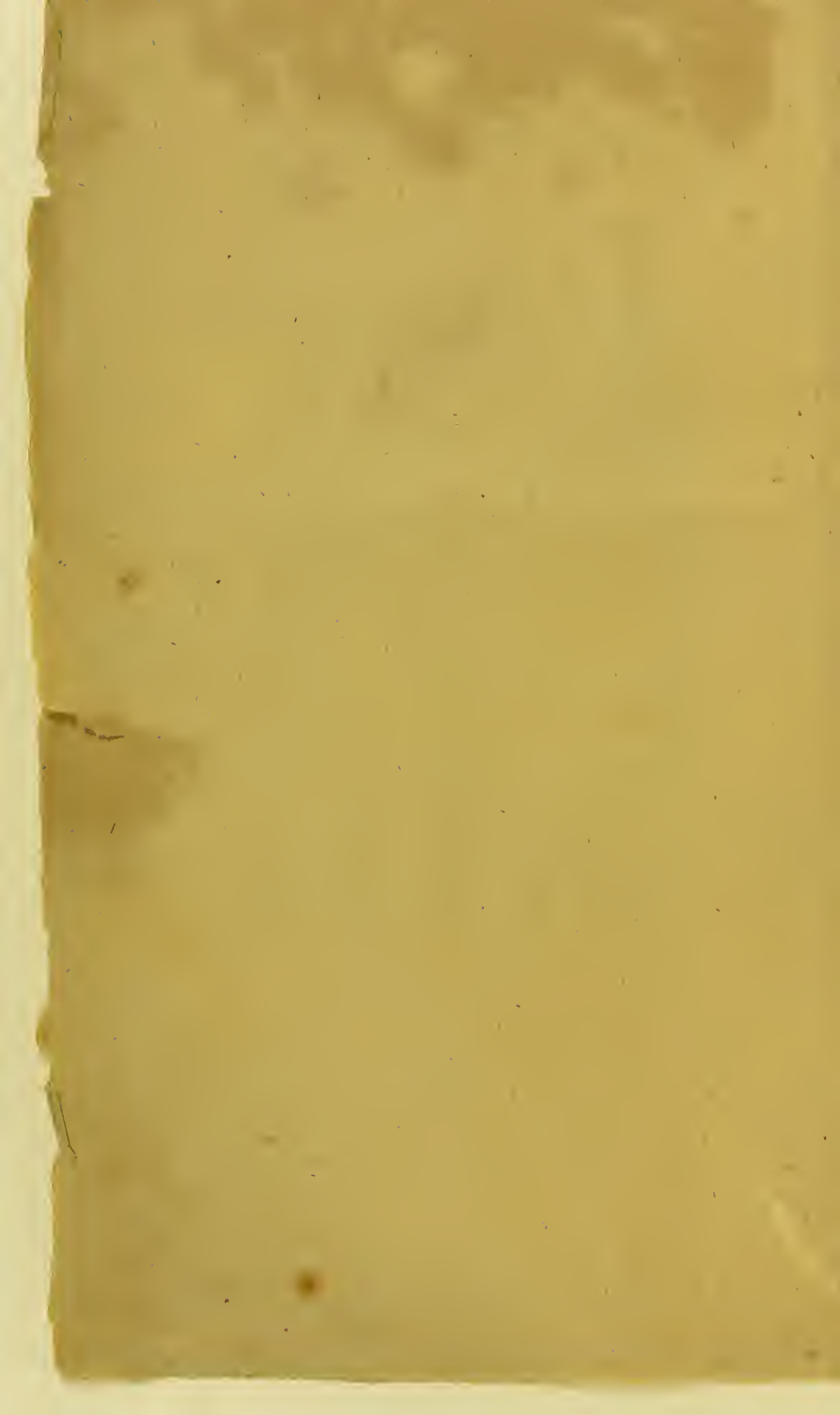
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KING'S COLLEGE LONDON



AN
INQUIRY
INTO THE
ANTIVARIOLOUS POWER
OF
VACCINATION.



AN
INQUIRY
INTO THE
ANTIVARIOLOUS POWER OF
VACCINATION;

IN WHICH,
FROM THE STATE OF THE PHENOMENA,
AND THE OCCURRENCE OF A GREAT VARIETY OF CASES,
THE MOST SERIOUS DOUBTS ARE SUGGESTED OF
THE EFFICACY OF THE WHOLE PRACTICE,
AND ITS POWERS AT BEST PROVED TO BE ONLY
TEMPORARY.

FROM WHICH ALSO WILL APPEAR,
THE NECESSITY OF, AND PROPER PERIOD FOR AGAIN
SUBMITTING TO, INOCULATION WITH
VARIOLOUS VIRUS.

By THOMAS BROWN,
SURGEON, MUSSELBURGH.

KING'S COLLEGE HOSPITAL

MEDICAL SCHOOL.

Magna est veritas, et prevalebit.

EDINBURGH :

Printed by George Ramsay and Co. for the Author ;
AND SOLD BY ARCHIBALD CONSTABLE AND CO. EDINBURGH ;
AND CONSTABLE, HUNTER, PARK, AND HUNTER,
LONDON.

1809.

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TO

ALEXANDER MONRO, M. D.

PROFESSOR OF ANATOMY AND SURGERY IN THE UNIVERSITY
OF EDINBURGH, FELLOW OF THE COLLEGE OF PHYSICIANS,
AND OF THE ROYAL SOCIETY.

SIR,

IT is with extreme regret, that, after nearly nine years experience in the practice of vaccination, I am under the painful necessity of confessing, I have almost arrived at that point, which your superior information in the laws of the animal economy, your acuteness of perception, and your accurate observation, enabled you to attain at the commencement of the practice, and to judge so decidedly of its merits.

b

Although I believe, like a very great proportion of the medical profession, you have not afterwards been able to resist the evidence brought forward in favour of vaccination, still I cannot in justice to the subject; to the public, to you, and to myself, omit this opportunity of stating, the remarkable terms in which you then expressed to me your opinion of the discovery: "You thought the consequences to the public were so dangerous, that the practice ought to be prohibited by act of Parliament."

I trust that the reasons and evidence contained in this work, will appear to you such, as clearly to evince the uncertainty and dubiety, which still hangs over the whole discovery; and I am fully satisfied, from your high professional situation, your candour, and your anxiety at all times for the attainment of truth, you will perceive the necessity for the thorough investigation of a practice, the consequences of which, in

a national view, may be so alarming and disastrous. I beg you will accept of this as a small testimony of my gratitude, esteem, and sincere respect.—I am,

SIR,

Your most obedient,

Humble servant,

THOMAS BROWN.

MUSSELBURGH, }
22d May 1809. }



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DEFINITIONS.

As this work may probably fall into the hands of those who are not of the medical profession, it may be necessary to give some explanation of the sense, in which a few terms are employed.

By *Vaccination* is meant—inoculation with the cow-pox matter.

By *Inoculation*, when accompanied with no other word explanatory of its meaning—inoculating with small-pox matter.

By *Vesicle* is to be understood—a pock, or small collection of fluid, produced from the inoculation of cow-pox matter, and which, in general, retains, in its advanced stage, a more diluted, and less opaque appearance, than the small-pox pustule.

By *Pustule*—a pock, or collection of fluid, produced either by the introduction of small-pox matter on the point of a lancet, or from the epidemic disease; and which, in general, ends in the appearance of pus.

The term *Vaccine Virus* implies—that fluid, or matter contained in the cow-pox vesicle; and the term *Variolous Virus*—the fluid contained in the small-pox pustule.

The terms Vesicle, and Vaccination, are employed more for brevity, and in contradistinction to the terms pustule and inoculation, as well as in deference to the present fashion of treating the subject, than from any conviction of their correctness, and propriety.

By *Chicken-Pox* and its varieties, are also to be understood—the Swine-Pock in England, and the Blebs and Horn-Pock in Scotland.

The term *Specific Influence*, is here meant to convey, not only a distinct diseased action of the system, which, while it exists, is supposed to prevent the operation of any other, but also, that, in its consequences, it prevents the repetition of the same disease; and, in the case of the operation of the cow-pock influence, it is contended, prevents the small-pox also.

ERRATA ET CORRIGENDA.

Page 15, line 13, *read* the—p. 28, l. 11, *for* demands *read* demand—p. 80, l. 18, *delete* but also the cows—p. 82, l. 12, *for* confidently *read* confidently—p. 167, l. 13, *for* his *read* her—p. 174, l. 16, *for* , *read* ;—p. 210, *for* Case XII. *read* Case XIII.—p. 220, l. 7, *for* areola *read* areolæ—p. 221, l. 10, *for* that *read* as—p. 242, l. 15, *for* recurred *read* occurred—p. 258, note, *for* where *read* when.

CHAP. I.

INTRODUCTION.

IT is now about ten years since vaccination was introduced to public notice by Dr Jenner; and notwithstanding its novelty, and altogether unprecedented nature, it received such patronage from the medical profession, and such encouragement from the public, as to have consigned inoculation to contempt and oblivion.

This rapid progress will appear more surprising, when it is considered, that the disease for which it was introduced as a substitute, had been known upwards of a thousand years, and extended

its ravages to all quarters of the globe; that the practice of inoculation had also subsisted for near a century, and had attained to such extent, and improvement, as to offer to every one who chose to avail themselves of it, an opportunity to cancel one chance in five, against his existence, with only the risk of one in five hundred.

The vaccine practice was introduced, and recommended to the public by its author, as a perfect antidote, and security, against the small-pox, without any exception, or reserve; and if properly patronised, capable of banishing variola from the catalogue of human misery.

So great a character, and seemingly supported by facts, and experiment, naturally led every candid practitioner to a trial of its merits; and all who have wrote upon the subject, have acquiesced with the grand results of its author, and have practised, and

patronised it, with a zeal hitherto unexampled.

The advocates for vaccination, therefore, have, in my opinion, very unjustly declared, that a variety of causes have occurred, to discourage, retard, and prevent the extension of a practice, which was entitled to the greatest encouragement, from the blessings it was capable of bestowing upon society.

I must confess, I cannot see the justice of this accusation; for nothing short of compulsory measures were omitted. No sooner did Dr Jenner announce his discovery to the public, and its merits were examined, than every facility was given to its circulation. The rage was extreme, and fashionable, not only amongst the medical profession, but all classes of society; so that, in less than two years from its first introduction, one of the most valuable, and ancient improvements in the whole history of me-

dicine, was almost entirely neglected, and given up. Even the lower orders of the community, seemed to enter into the subject with enthusiasm; forgot, or laid aside their attachment to old habits; and, notwithstanding its unpleasant name, and origin, vied with their superiors, in promoting, and extending its influence.

As a proof of this, we may only refer to the remuneration granted by the nation to Dr Jenner; the different societies instituted for its encouragement; the hospitals established for extending the disease, and the amazing number that have undergone the process of vaccination.

It has been also asserted, that it had to encounter the opposition of designing, and ignorant men. It must be confessed, that, at the commencement of the practice, an opposition arose from a few individuals of the profession; but so far from thinking that it was inimical to the new practice, I

am convinced that it contributed not a little, to increase its reputation, and to extend its influence. Their arguments in general were deemed weak, their assertions unqualified, their facts few and insignificant, and upon the whole conducted with such a total want of the true spirit of inquiry, as, hitherto, not to be considered as any exception to the general rule. They not only gave an easy victory to their opponents, but contributed to the total extinction of all opposition, by creating a terror in every liberal mind, at being blended with such a contemptible minority. I am afraid, however, it will too soon appear, that such opposition ought to have been attended to; and, at all events, no grounds were afforded, for such *unqualified* resistance to the production of every species of proof.

In my opinion, such opposition was most unfortunate for the public; for undoubtedly, so far from its being charged as a crime,

not only all liberal-minded medical men, but the legislature of the country, and its whole enlightened population, should have seen the necessity for the most positive proof of its efficacy, before they relinquished so *beneficial* and *rational* a practice as that of inoculation, and ought to have excited inquiry, and called for information, from all quarters. It was evident, that Dr Jenner's facts were far from conclusive; they were even contradictory, and it was acknowledged, that nothing analogous existed. The two circumstances of resisting inoculation, and exposure to the epidemic, were deemed sufficient to overpower all opposition, and do away all contradiction; and every one who could still resist such proof, must be either stupid, or wickedly perverse.

It has been farther alleged, that cases where vaccination has been said to fail, have been sought after, not only with eagerness, but with misrepresentation; and that a de-

gree of importance has been given them, which the circumstances neither justified, nor required. Here we must observe, that there is a strong indication of that arbitrary mode of proceeding, which will be found to attend many parts of the history of vaccination. It seems but little to accord with a good cause, to stifle inquiry, or to be averse to facts. In my humble opinion, it would have been more consistent with judgment, and justice, at the commencement of such an innovation, to have invited every possible information; and particularly every case, where it seemed to fail in giving security against small-pox; for upon these undoubtedly, as the learned, and acute author, of the article in the seventeenth Number of the Edinburgh Review, very properly observes, the practice must stand or fall. Do those gentlemen mean to contend, that there is less merit, or less virtue, in endeavouring to correct a public error, than in

propagating what is good, when both parties must be supposed to be influenced with the purest motives? or do they really imagine, that the subject neither admits, nor requires any more proof? They are perhaps not aware, that by such conduct, if they do not become contemptible, they may at least become guilty, and entail trouble, disappointment, and danger, upon a very great portion of the human species. I am afraid, too, that the motives of its greatest advocates, are not more disinterested, than those of its greatest enemies. The mind of man is composed of curious materials; not only does system warp the judgment, but having once unequivocally adopted an opinion, and having gone great lengths in propagating it, few have candour, resolution, and honesty to retract. In many professions, but in none more than the science of medicine, is the mind inclined to systematize: As the field is extensive, and difficult of accu-

rate observation, the danger of system is the greater ; a thousand errors may be committed without the least perception of guilt, and hundreds of our fellow creatures may suffer, without producing the smallest amendment.

The admirers of vaccination contend also, that it is an operation of great niceness, and difficulty, and that much mischief has been done by ignorance. This is comparatively a new doctrine, and has arisen from the same necessity of explaining facts, which are found to be adverse to the practice. The author of vaccination, and others, contended at first for no such difficulty ; on the contrary, such was its perspicuity, and certainty, as even to be safely trusted out of the hands of medical men, and recommended as one of the *best means* for rendering it universal. But now, according to Mr Bryce, few of the medical profession are capable of conducting it with precision, and effect. When

he inculcates such intricacy, and proposes such compound plans, he surely forgets that, if really true, they directly militate against the practice, and would be sufficient of themselves to overturn it. Besides, we shall see Mr Bryce must overlook his test of double vaccination, for if it really possessed what he alleges, the most ignorant, and inattentive of the human race, might vaccinate with precision. To those who consider the mystery, and difficulty he has thrown over the practice, and peruses his plan for the extension of vaccination with attention, the idea of a monopoly must spontaneously occur, did not Mr Bryce's well known character forbid the entertainment of such a thought, even for a moment; but I must say, that his partiality to this subject has led him too far, and, in his eagerness to rescue it from every imputation, he has thrown a mystery, and intricacy over the practice, couched in terms too vague, and unguarded,

at the expence of the rest of his professional brethren.

It now appears, however, notwithstanding the grand character given it by its author, the concurring testimony of nearly the whole profession, and the evidence in its favour from extensive trials, that the medical profession ought to have proceeded with more caution, and not have substituted it entirely for inoculation, until a few more years had elapsed. It is now admitted, from the most undoubted testimony, that there are many cases, where small-pox have taken place after having undergone perfect vaccination, and the Report of the College of Physicians in London, unequivocally admits, that they entertain no doubt of this fact. The grand advocates however of the practice, still contend for the contrary, and find a ready solution of all possible difficulty, from imperfect vaccination, constitutional and local symptoms, or that the practitioner must have

committed a mistake with regard to the nature of the eruption.

If it should prove, however, to be the fact, that persons who have been vaccinated do take the small pox, then the two great objects said to be attained by the practice, must be given up as chimerical; and in place of finding the total banishment of small-pox possible, and the individuals placed in a situation of security, and ease upon the subject, all who have, and will submit to the practice, must be plunged into the most distressing state of doubt and anxiety.

I have no hesitation in confessing, that I became an early convert, and advocate, for the new practice; and it is now eight years and a half since I have uniformly advised, and practised vaccination, in which period, I may safely say, I have vaccinated upwards of twelve hundred, and have only had three cases of inoculation, which were at the positive request of their parents. This I per-

severed in, until the present moment, notwithstanding I met with several instances where it appeared to fail in giving security, about three years after the introduction of the practice; a few more about two years ago; and those which make a part of the present volume within the last six months.

I was favoured with the first virus I used from Mr Anderson, surgeon in Leith, and it produced the disease in such a perfect form, that I have not in any instance seen it exceeded.

According to the usual custom then, the child (Lieutenant-Colonel Campbell's) was afterwards inoculated, and a highly elevated tumor, with a little inflammation round its base, but no pustule, was produced. I confess from these effects, as they differed considerably from the appearances which take place upon re-inoculation, my conviction of its security was not a little staggered, and I then suggested my doubts of its being a

complete antidote. I have since, from all the trials, experiments, and practice I have had, seen no cause to change my mind; but being satisfied of its powers as abating, and checking the influence of small-pox, if not totally subduing it, I did not think myself warranted, upon my own practice and opinions, to make any change, or to endeavour to influence others. Within the last six months, however, in consequence of the small-pox making their appearance, not only in Musselburgh, but in the whole vicinity, such a number of striking cases have been pressed upon my observation, and such a forcible appeal made to my senses, that I could no longer resist the conviction, that vaccination, even in the most *perfect form*, is not only incapable of imparting *permanent* security against small-pox, but even of *retaining* the system in that state of impregnation, capable of only allowing it

to exercise its influence, to a *safe* or *trifling* extent.

With these facts before me, together with the impression they have made upon my mind, I did not feel myself justified in withholding them from the public, and have accordingly hastily drawn them up, in order that no time may be lost for bringing forward new facts, which may either confirm, or overturn the practice. In the mean time I shall add, that until the experience of others coincide with my own, I shall not condemn the practice, but at same time, I shall not think myself justified in pressing it, in the way I have hitherto done.

Lest some should be so uncandid as to observe, that from such a great proportion of the cases belonging to me (where small-pox has occurred after vaccination), a strong proof is afforded of their having been improperly vaccinated; I have to remark, in addi-

tion to what will be found in its proper place, that it is but natural I should meet with more cases of my own, than of any other person, while I continue to attend to my own duty, more than my neighbours', and when I never went out of my own professional circuit, to inquire after them. But here all defence is entirely superseded, by the example and declaration of the Royal College of Surgeons in London, who have not hesitated to declare, that every other evidence is imperfect and nugatory. Therefore, although I could still readily defeat this objection, it would only be subjecting myself unnecessarily to the imputation of want of respect and civility to my professional brethren, to insert more than what was just necessary to prove, that the occurrence was not entirely confined to my practice.

I can hardly conceive it possible any one will allege, that an unnecessary and impro-

per industry has been used in collecting facts. Such an insinuation deserves to be treated only with contempt; for I apprehend, on a point of such national importance, it is an indispensable duty to inquire carefully, and anxiously, after every circumstance in the least connected with the subject.

I think it also but justice to myself to declare, that I have never perused a single publication belonging to those who have been called the antivaccinists, and all that I know of their arguments, facts, and assertions, is entirely obtained from the works of their determined enemies, and the admirers, and promoters of the practice. Therefore, if my mind should be supposed to labour under any prejudices inimical to vaccination, they must have been produced by causes, that are generally capable of exciting a quite opposite effect; and whatever objections I now have to the practice, must

be entirely derived from the statement of the vaccinists themselves, and from my own experience, and observation.

It is perhaps proper to notice, that I carefully avoided having any communication with the different practitioners by whom the children were vaccinated, being aware of the strong hold that system has upon the human mind, more especially in this very important subject; thinking it best for the attainment of truth, to state with the greatest possible accuracy, the parents' account of the circumstances that attended the vaccination of their children; notice the appearance of the arm; and give the names of the families, whereby an opportunity is afforded to any of the practitioners to satisfy themselves.

With regard to the plan I have followed in this work, as it was not my intention to give any general history of vaccination, I have avoided, as far as possible, entering

into any detail or discussion, not connected with my present inquiry. All my object is to show, that the most serious doubts are suggested of the efficacy of the practice, not only from the cases which have occurred of small-pox after vaccination, but also from the confused, uncertain, and contradictory state of the principal phenomena of the disease. How far I have succeeded it is not for me to decide; and whatever error the work contains, I hope the motive of contributing my mite to the benefit of the public, the expedition with which it was brought forward, and my other professional duties, will at least plead some excuse.

CHAP. II.

A CONCISE VIEW OF THE STATE OF INOCULATION PREVIOUS TO THE INTRODUCTION OF VACCINATION.

WHEN the practice of inoculation was first introduced, the ravages of small-pox were dreadful in the extreme; their progress was marked with desolation and dismay; and all ranks of society were exposed to their effects.

Although, upon an average of years, a greater number may have fallen a sacrifice to that disease, since the commencement of inoculation, in consequence of its affording a constant source of infection, yet still it deprived it of that desolating appearance, and afforded to all, who availed themselves of the

discovery, a complete antidote to its baneful effects, imparted perfect satisfaction, and totally destroyed all future anxiety and apprehension.

It is now nearly a century since the practice was introduced; and during the whole of that time, it is even allowed by the keenest advocates for vaccination, that there are perhaps not twenty well authenticated instances in this country, where those who have undergone inoculation, have taken the natural disease; a fact of the most striking and satisfactory kind.

The extent to which the practice of inoculation had attained, immediately preceding the introduction of vaccination, was, that every individual who composed the rational, and intelligent part of society, availed themselves of its advantages; seized the opportunity of snatching his offspring, from the desperate chance of one in five against his existence, at only the hazard of one in five hundred or a thousand, and nearly the

same proportion, in favour of preventing any other distressing consequence.

Although inoculation so rarely produced any severe, and permanent bad effects, yet those who underwent the operation, were frequently subjected to many distressing symptoms. It could not, however, be owing to this circumstance entirely, that the practice was not generally followed. It is evident, that any practice, carrying with it the advantages already mentioned, and adopted by the intelligent part of mankind, must have, in the course of so long a period, become universal, had every exertion been made, which the nature of the subject admitted and demanded. Unfortunately, however, the lower classes were allowed to retain their prejudices, from want of attention to use the necessary means for dissipating them, and those who adopted the practice, consoled themselves with their private benefits. Neither the Legislature, nor other public

bodies, put themselves to any regular system of patronage ; and the practice was left to work its way through so many obstructions, merely with its own advantages, and the occasional exertions of individuals. I think there cannot be the smallest doubt that, had the necessary exertions been resorted to, it would have been rendered more easy in every particular, and the practice would have become so universal, as to have rendered the epidemic disease quite insignificant, if not extinct.

In the practice of inoculation, a virus was used, taken from the disease you meant to combat ; it produced one possessing all the leading features of the original ; it seldom or never passed on, without producing less or more of those characteristic symptoms, upon which the certainty of its powers were known to depend ; there was no doubt about the qualities of the virus ; there was no nicety of distinction about perfect

and imperfect inoculation ; no contradiction and confusion about the certainty of constitutional affection ; the practitioner was not reduced to explain facts as suited the peculiarities of the case ; and lastly, it may be safely asserted, without the hazard of contradiction, that after inoculation was accomplished, the person was found, from every experience, safe against all future attacks of the disease, and that not only the parents, but the individuals, were for ever at rest upon the subject.

When it possessed these positive advantages, notwithstanding every individual of the profession followed a different method, and no general rules obtained relating to the operation, or after-treatment ; it may be safely concluded, that had the practice been more reduced to a system, and less subject to the fancy of individuals, the average would have been reduced to one in fifteen hundred, or two thousand. That this con-

clusion is not too much strained, may I think be safely admitted, when we consider the variety of practice that existed in all the different stages of the disease ; from the introduction of the virus, down to the conclusion of the disorder. It is to be particularly kept in view, too, that in the practice of inoculation, there was little cause for apprehending that the symptoms would be mild and inconclusive ; the contrary was the general result, and therefore evidently required the exertions of the practitioner, and by no means allowed such a contrariety and inactivity of practice.

It is well known that, in the practice of inoculation, some preferred one age, and others inoculated at all ages ; some used virus of any kind, and others only a certain state of it ; some one mode of introducing it into the system, and others a totally different ; many contented themselves with introducing the virus into one spot, while

others applied it to more; some preferred one situation, while others made choice of one quite contrary; some inoculated in one arm, some in both; and many covered the spot where the virus was introduced during the whole course of the disease, while others exposed it, or did nothing at all.

After the mere introduction of the virus, many were of opinion, that every thing was accomplished; some that very little more was necessary; and a few that it was proper to watch the whole progress of the disease. Some of those inoculated, therefore, got nothing under any circumstances, and some got medicine under all situations; some treated the inflamed pustule in one way, some in another; and many totally neglected it. During the eruptive fever, many trusted entirely to the influence of cold, while others conjoined the assistance of medicines. The treatment after the eruption was equally vague and contradictory. If

the eruption was so extensive as to make it an object of attention, and the life of the patient in danger, many trusted entirely to the influence of cold through the whole course of the disease ; others joined purgative medicines only, to a greater or less extent ; many persevered with cold, till their patients' teeth were shivering to pieces, as being the best antiseptic ; while others trusted to bark, blisters, and wine ; and few, or none, thought of the warm bath, pediluvium, opiates, and cardiacs.

I consider it quite superfluous to point out, particularly, the effects that must have resulted from such opposite practice. I have no hesitation in saying, that those who paid the least attention to the whole progress of the disease, deprived his patient, in the same proportion, of the chance of an easy and safe termination. I can also take it upon me to say, that, by taking virus from a highly inflamed arm, introducing it in a manner

that produces an extensive, deep, or irritating wound, applying plasters, or any other means of producing heat, neglecting local means to moderate the inflammation of the arm, and trusting entirely to cold to moderate the eruptive fever, will increase all the distressing symptoms to an alarming degree, and the deaths to one in little more than a hundred. But if, on the contrary, attention is paid to all the peculiarities which art, science, and constitution demands, I can assert, from my own experience, that he will not lose above one in a thousand.

Before the practice of vaccination was introduced, I had inoculated upwards of twelve years, and, upon a moderate calculation in that period, not fewer than from sixteen hundred to two thousand. Out of all this number, of every description, only two died, and these were belonging to the lowest description of paupers, with large families, crammed into one small

space, and small-pox epidemic in the neighbourhood. The method I followed, was, using virus when the pustule was only moderately inflamed; merely introducing it by one small puncture with the point of a lancet, in general on the left arm, using no applications to the part, but a small piece of flannel applied the day following, and kept on, only two days. The sleeve was then tucked up, and the pustule exposed.

A day or two previous to the eruptive fever, in certain situations, I ordered the whole body to be washed with soap and warm water, and the child to lie as little as possible upon the inoculated arm. Where the inflammatory symptoms and fever ran rather high, I kept the arm particularly cold, either with hair powder, or cloths dipt in cold water, and when remarkably inflamed, an emollient poultice was applied, which, upon being repeated two or three times, entirely relieved the patient. Along with

thése means, I took care to keep the body cool and the belly rather loose. In the latter period of the disease, when the number of the pustules constituted the cause of danger, and that the age, and strength of the patient were unable to mature, and afterwards to resist the irritation arising from so much matter, either applied externally, or absorbed, I can assert, from extensive experience in the epidemic disease, that the persevering in exposure to cold is downright folly, and could be easily shewn to be contrary to the principles of rational theory, as well as common sense. On the contrary, when I observe the pulse becoming quick, attended with rigors, grinding of teeth, delirium, &c. I instantly order the warm bath, frequent pediluvium, the liberal use of cardiacs and opium, and frequently succeed in rescuing the patient as it were articulo mortis.

CHAP. III.

A BRIEF ACCOUNT OF THE PRINCIPAL CIRCUMSTANCES RELATING TO THE PRACTICE OF VACCINATION, AS ADMITTED BY ITS WARMEST ADVOCATES.

SECT. I.

As given by Dr Jenner.

ALL the leading circumstances which the founder of the practice of vaccination has given in his different publications, will be found to be nearly included under the following heads.

I. He more than insinuates, the very great probability of the human species being liable to many diseases, in consequence of being domesticated with many animals.

From this account of the state of inoculation, it was not surprising that the most distressing symptoms frequently occurred, and that death occasionally happened. It is also to be observed, that the practice had not improved of late years in this respect, but seemed rather increasing in instances of unpleasant terminations; and no attempts were made to place it on a more scientific footing. It was in this situation that vaccination made its appearance; and, from its strong recommendation, great safety, and seeming efficacy, it exploded inoculation nearly in two years after its first introduction, but with what justice, in my opinion, still remains to be seen.



II. That he was led to the subject by finding, that many whom he was called upon to inoculate resisted every effort to give them the small-pox, and upon inquiry found, that a vague opinion prevailed, in the district of country wherein he resided, that those persons who underwent a disease known by the name of cow-pox, were considered as secure from the attack of small-pox.

III. In opposition to this conclusion he observes, that upon inquiring at the different practitioners all round, he found, that from experience they did not consider the cow-pox as affording any security against small-pox, and also, the farmers informed him, such an opinion had only taken place within their own memory.

IV. That this opposition of facts, and opinions, might be accounted for, from the common people not submitting to inoculation at the earlier periods of the practice,

and of course, the working people in the dairies, were not put to the test of the preventative powers of the cow-pox ; and also from his discovering, that the cows were subject to various eruptions upon their teats.

v. This also, however, was not without contradiction, for he found, that there were many persons who had gone through the genuine disease, and still were subject to small-pox.

vi. That this disease was then only communicated to the human species, by being accidentally infected from ulcers on the teats, and udders of the cows.

vii. That now from his experience, and experiments, there are the strongest grounds for believing, that the origin of this ulceration upon the teats of the cows, is from the matter discharged from horses heels in the state of disease called grease, and applied by the hands of milkers, or otherwise, to the cows.

VIII. That, by inserting this virus with the point of a lancet under the cuticle, a pustule is produced, attended with such circumstances, as not only to resemble the affection produced from the application of the virus to the hands, or otherwise of the milkers, but also to produce the same result, viz. the complete security against the infection of small-pox.

IX. From the appearance that took place on the first case of vaccination by Dr Jenner, he hailed, and felt satisfied, of the complete success of his new practice.

X. That the peculiarities of vaccination are the following; a superficial suppuration, of a circular form, with edges more elevated than its centre, and of a colour distantly approaching to blue, surrounded with an erysipelatous inflammation, of a greater or less extent. That to these appearances succeed symptoms, shewing an affection of the general system, such as headach, quick pulse,

heat, lassitude, pains about the loins and limbs, vomiting, and sometimes attended with delirium. These symptoms vary in their duration, from one, to three or four days, and the disease is generally over by the eighth.

XI. Dr Jenner, in the progress of his work, when detailing cases of various kinds, refers some of the appearances, sometimes to local irritation, and sometimes to constitutional affection.

XII. That however some of the appearances may be absent, from which the peculiar qualities of the disease are inferred, yet still it may, and does possess the antivariolous power.

XIII. He gives several cases where the persons have had the small-pox, and yet have gone through vaccination, even with all the constitutional symptoms, but which, in these cases, he explains away, by saying, that they were merely owing to local irritation, and not to any constitutional affection.

xiv. In like manner, where persons have gone through the cow-pox repeatedly, he endeavours to refer all the symptoms following the subsequent attacks, to local irritation only.

xv. He admits, in one part of his work, of the possibility of a person who has had the small-pox, being nevertheless liable to repeated attacks of cow-pox, and in another, endeavours to get rid of this, notwithstanding the several cases previously brought forward.

xvi. That the instances of vaccination succeeding small-pox, are not more common, than small-pox succeeding inoculation, or the natural disease.

xvii. All the cases of small-pox succeeding vaccination, which have either occurred to himself, or have been reported to him by others, he positively refers to imperfect vaccination, arising from the use of virus in

an improper, or vitiated state, which it readily assumes from various causes, and will on no account admit the possibility of small-pox succeeding to real vaccination.

XVIII. That the causes of imperfect vaccination are, matter that is taken from a pustule, which never contained any specific vaccine virus ; or from its having lost the specific quality by putrefaction, maturation, or suppuration ; and from matter taken from a pustule produced upon the human skin, by virus generated from a disease in the heels of horses.

XIX. He gives several cases of security against small-pox, arising from the effects of virus from horses heels, and again gives others where it failed, and seems to think it necessary, in order to obtain the perfect disease, that it must pass through the medium of the cow, and therefore refers all these cases of contradiction, to imperfect, or vitiated virus.

XX. In many instances he refers those cases of vaccination failing, where the insertion of the virus is either followed with no effect, or with an erysipelalous inflammation, and no pustule, to vitiated virus.

XXI. He describes, in one part of his work, the appearances upon inoculating those who have undergone vaccination, to be, in no instance, more than a slight erysipelalous appearance round the punctured point, attended with no elevation, or pustular appearance, and always to disappear in three or four days at farthest. In an after part of his work he allows, that a pustule may be produced by such inoculation, and that, too, capable of communicating small-pox to another; but that no constitutional affection was produced in the person who had been inoculated after vaccination.

XXII. This erysipelalous appearance, he considers as one of the best tests of the sys-

tem having been previously rendered secure, either with small-pox, or cow-pox, as he says it takes place equally the same in both cases, whichever virus you reinoculate with.

XXIII. That Dr Jenner seems often to have failed in producing the disease, after using a lancet infected, as must be concluded, to his mind.

XXIV. He considers the cow-pox as the original affection, and that small-pox is only a modification of it; and therefore he considers it as capable of assimilating, weakening, and destroying the variolous virus, even where it may have previously exerted itself on the system.

XXV. That it is capable of arresting the progress of scarlatina, and other exanthemata, and vice versa; that it does not seem to exert its influence when the surface of the body is under some cutaneous diseases; that it neither conveys, nor increases, the

tendency to other diseases; is perfectly harmless and safe, as a distinct disease; not possible to be produced but by contact, accompanied with abrasion of the skin; attended with no pustules, and loses nothing of its activity, and efficacy, by successive vaccinations.

SECT. II.

The result of the experience of other Authorities.

I. IT seems to be regarded as *certain* by some, and *flatly* contradicted by others, that the matter of grease, taken in a certain period of that disease, is equally capable of producing perfect vaccination, with that from the cow, and probably the purest source of the two.

II. All vaccinists agree in opinion, that the perfect or constitutional vaccination imparts such complete security against the dis-

ease of variola, as was obtained under the practice of inoculation ; and also, on the contrary, that the imperfect, local, spurious, or irregular vesicle, or disease, does not.

III. The evidence by which a regular, perfect, or constitutional vesicle, in the form of vaccination, may be known, are those already noticed as mentioned by Dr Jenner, but allowed to be frequently, if not generally, without the evidence of febrile symptoms attending it. Nearly every author, laying the greatest stress upon the regular progress of the punctured point to a vesicle, the appearance of which has been already described, succeeded with an erysipelatous inflammation, giving a ring-like appearance, of greater, or less extent, and this succeeded with the vesicle acquiring the form of a scab, of a particular dark colour, and somewhat transparent.

IV. There are great variety in the characteristics of what has been termed the

spurious, local, imperfect, or irregular vesicle ; almost every author describing a greater or less variety of appearance, forming a gradation of the least perceptible difference from what they call the perfect vesicle, to that point, where no vesicle whatever is produced.

v. From all accounts it appears, that there is no one certain criterion, by which the certainty of the success of vaccination, as fortifying the constitution against the influence of variola, can be inferred. Mr Bryce, however, contends, that double vaccination is that test, and wherever it has been obtained, a complete security may be depended upon.

vi. It is by no means generally agreed, that the inflamed areola is indispensably requisite to constitute the presence of perfect vaccination. Neither do they agree in the necessity of the presence of constitutional symptoms, to produce the antivariolous

power. All, or most of them admitting, that they have many cases of vaccination, where neither were present, and still the antivariolous power seemed so perfect, as to resist re-vaccination, inoculation, and contact with persons labouring under confluent small-pox.

VII. They are also under the necessity of admitting, that even where the pustules are, according to their own opinion, imperfect, or spurious, yet still on re-vaccination, inoculation, &c. they resist their influence.

VIII. It is even asserted, that genuine virus may be converted into spurious, and spurious matter may be converted into genuine, and give the perfect vaccination.

IX. It is generally understood, that the vaccine pustule differs *in toto*, in its structure, from the variolous.

X. It is unanimously agreed, that although a rash sometimes attends vaccina-

tion, yet in no instance are there any pustules.

XI. It is now generally allowed, that the common period of the duration of vaccination, is seldom under from nine to twelve days.

XII. In general all practitioners prefer the virus in a limpid state, taken from the fifth to the ninth day, and allow the virus that flows first to be the strongest. But it is also admitted, that the perfect disease may be given by virus taken even to the fourteenth day, after every limpid appearance is gone, and evidently in a state of viscosity and suppuration. Mr Bryce, with a few followers contend, that the scab is capable of giving the perfect disease, and to the same certainty, as in its most active limpid state.

XIII. All agree in the difficulty of keeping the virus any time in a state of such activity, as to depend upon its producing

the desired effect. It is, however, asserted, that the scab retains its power of imparting the perfect disease many months.

xiv. It is also universally acknowledged, that there are many instances where the practitioner fails to give the disease, although every thing has been obtained to his own satisfaction; and the instances are numerous, when placed in other circumstances.

xv. It is almost universally admitted to be quite safe, and mild, communicates no other disease, and can only be conveyed by inoculation, or a process similar to it. A few of the most violent opposers of the practice have contended, that it is capable of producing several new, wonderful, and dangerous diseases.

xvi. It is asserted by Jenner, and others, that not only exanthemata, but also chronic affections of the skin are unfavourable to, and resist vaccination; while others con-

tend, that vaccination may be perfectly accomplished under such situations.

XVII. It is contended strenuously by nearly every author, and by almost every practitioner, that it is a perfect antidote against the small-pox, if the disease is properly communicated ; and Dr Jenner, and his relative Mr G. Jenner, positively assert, that they have not had one instance of failure in their own practice. They all therefore, and without hesitation, refer the whole of them that have been brought forward, to the sweeping power of imperfect vaccination, or to the blindness, and stupidity, of the medical practitioner, who could not distinguish the difference between small-pox, and chicken-pox, a rash, or bug-bites.

XVIII. It is generally admitted also, that the two diseases may coexist ; that is to say, that you may have a perfect vaccine pustule, while the body is under the influence of variola, and covered with pustules; and by

taking virus from each of the two sources, you will propagate the two diseases distinct from each other. At the same time it is also acknowledged, that they frequently subdue each other, depending upon the priority of their effects upon the system.

XIX. It is asserted by many, that there is no such disease produced by the mixture of cow and small-pox virus, as that called hybrid, or in other words, a distinct infection, partaking of the nature of both.

XX. In most authors, there are great variety in the account of the appearances from inoculation after vaccination, as well as in cases of re-vaccination. It is now pretty generally understood, that upon inoculation after vaccination, you may produce tumors, less or more attended with a pustule, sometimes resembling a small vesicle, or an elevated tumor, and sometimes a distinct pustule, with more or less virus in it, but in general very little; and this ap-

pearance, sometimes surrounded with a large, and highly inflamed areola. Upon using the virus contained in this pustule, the small-pox have been communicated.

XXI. All the advocates for vaccination contend, that its antivariolous power is not of a temporary nature, but permanent, and if the practice is persevered in, and becomes universal, it must infallibly eradicate the small-pox. But those who have been called the antivaccinists, have contended, that it either possesses no antivariolous power, or that it is merely temporary.

XXII. There are perhaps, upon an average, about a hundred well authenticated cases, where vaccination has been communicated from the cow to the milker, in what is called the natural way, resisting the small-pox; and in the way of inoculation after vaccination, there are upwards of a hundred thousand.

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XXIII. Dr Woodville has inoculated many thousands in the space of six months after vaccination, and they all resisted the infection.

XXIV. It is asserted, that in those instances where small-pox have taken place twice, that the second attack is always very severe, and very frequently fatal.

XXV. It is supposed by some, that about one in sixty is capable of resisting vaccination, while others contend, that all may be made to undergo the disease.

XXVI. That, when the practice of inoculation was introduced, there was an equal hue and cry raised against its efficacy, and nearly the same objections as against the practice of vaccination.

XXVII. The very able report of the London College allows, that there is nothing analogous to this discovery in nature ; also, that there is sufficient evidence where the antivariolous power of vaccination has fail-

ed, although it seemed to be communicated in its most perfect form ; but that these cases are comparatively few, and by no means capable of overturning the immense mass of evidence, brought forward in its favour : indeed, those cases of alleged failure, not being greater than the proportion of deaths arising from inoculation. That, where such cases have occurred, they have uniformly varied much from the usual severity of small pox, and assumed a very trifling appearance.

XXVIII. The College also concludes, that they are equally safe from the epidemic small-pox, as well as from the inoculated ; and observe, that towns and villages have resisted the natural small-pox. They scout the idea of its being only a temporary security, not only upon the grounds already before them, of a practical nature, but also from analogy, of which they add, that there is nothing similar in nature.

XXIX. The disease, too, when contracted by milkers, has been subjected to a long test; as they allege, there are no instances where they have not resisted the small-pox.

XXX. The College conceive the practice of vaccination to be as completely established as the nature of such a question admits, and look forward to the period when all opposition shall cease, and the ravages, if not the existence of small-pox, shall terminate.

XXXI. The Medical Council of the Jennerian Society admit, that a few cases have been brought before them, where persons have taken the small pox, after having passed through the cow-pox in a regular way; but endeavour to remove the objection, by adding, that they have also cases, supported by evidence equally strong, where persons, after having regularly passed through the small-pox, either by inoculation, or the epidemic disease, have had the affection a se-

cond time, and such second attack is in general very severe, and often fatal; whereas, when it has appeared after vaccination, it has been always so mild and trifling, as even to render its existence doubtful.

xxxii. The Royal College of Surgeons in London admit, in their report, of fifty-six well authenticated cases of small-pox occurring after vaccination, besides what they rejected, upon the ground of not having been vaccinated by the surgeon who reported the facts relating to the attack of small-pox.

xxxiii. In the seventeenth number of the Edinburgh Review, there is a most excellent, comprehensive, and distinct view of the subject, where, in addition to the particulars already observed, are the following circumstances: They think there are about twenty well authenticated instances, where persons have had the small-pox after having gone through inoculation regularly, and allege, that there are not ten well authenti-

cated cases of small-pox occurring after perfect vaccination ; although, from the report of the Medical Council, they observe, there are nearly as many have undergone vaccination, as have been inoculated since the commencement of the practice, with this additional circumstance, that a very great proportion have been subjected to inoculation after vaccination ; thus, in their opinion, subjecting it to a severer test.

xxxiv. The Reviewer alleges, that the greatest number of failures took place previous to the year 1802, at which period vaccination came to be more accurately understood, and practised, in consequence of Dr Jenner's additional information. They also add, that they may conscientiously conclude, that it gives a security at least equal to the old practice of inoculation.

xxxv. Dr Adams, physician to the inoculation hospital in London, has published upon this subject, and endeavours to shew,

from the laws of morbid poisons, and experiments, that the vaccine and small-pox virus are the same. His opinion is founded upon the circumstance, that if mild cases of small-pox are used for inoculation, you will always produce a pustule, making a near approach to the vaccine vesicle, and, in a great proportion of these cases, no pustular eruption.

XXXVI. The Doctor also assumes, as a settled point, that no two local or constitutional diseases will continue at the same time, in the same place, or in the same constitution. He then proceeds to state, that if you inoculate to-day with chicken-pox, and to-morrow with small-pox, that the inoculation from the latter will remain unaltered, until the chicken-pox has completed its course; or if you introduce vaccine virus when the system is under the influence of measles, or chicken-pox, the same interruption will follow. He concludes, therefore,

that both cow-pox and small-pox are similar, and are equally different in their nature from measles or chicken-pox. But if we inoculate and vaccinate together, or vaccinate one day, and inoculate two or three days after, or inoculate first, and then vaccinate, both begin and go through their usual course, without any other alteration, than that the latest pustule or vesicle would be somewhat smaller.

XXXVII. Mr Bryce, one of the surgeons to the Edinburgh inoculation hospital, and who has published more than once upon the subject, agrees with the principle, that no two opposite actions, whether local or constitutional, can exist at the same place or time. He also is decidedly of opinion, that small-pox and cow-pox are two distinct and different diseases.

XXXVIII. Upon going through his works, we find, at page 43, two cases of Nelson's children, where the small-pox made their ap-

pearance to a considerable extent, on the eleventh and twelfth days from vaccination, although the vesicle and areola were perfectly characteristic of the constitutional influence, upon the ninth day from vaccination, and continued to be so during the whole of the eruptive fever, and followed afterwards its usual course; also, at page 192 and 194, he gives two cases which occurred to Mr Gillespie, and which he also had an opportunity of seeing, where the small-pox in one of them made their appearance ten days after having been vaccinated, but no areola had taken place previous to the eruption. When the fever went off, and the eruption became distinct, which was on the eleventh day from vaccination, an areola then made its appearance; and, as the child had undergone the double vaccination, an areola also took place in it, at the same instant with the areola of the first; both continued for two days. In the other,

the eruption took place on the eighth day from vaccination, and, in two days after this, the inoculated vesicle was attended with an areola, and was admitted to be in every way characteristic of cow-pox, and within this areola, several small-pox pustules existed, which advanced regularly to suppuration.

XXXIX. In No. VI. of his Appendix are to be found several cases, where both vaccine and variolous virus were introduced in the way of double inoculation, and a few days after the primary vaccination; from all of which it would appear, that the constitutional influence of vaccination hurried the second vaccine puncture, but had no effect upon the variolous, which however arrived at maturation at its ordinary period, but no surrounding inflammation, or pustules.

XL. He also states several cases of experiments, where it would appear, and which he says shews distinctly, that if you vacci-

nate a day or two previous to introducing small-pox virus, you will uniformly find, that the variolous pustule proceeds not only slowly in its progress, but its size and period of maturation considerably diminished.

CHAP. IV.

CONSIDERATION OF SOME CIRCUMSTANCES CONNECTED WITH THE PRACTICE OF VACCINATION.

BEFORE we proceed to examine the phenomena more immediately connected with the process of vaccination, it may be necessary to notice a few circumstances relating to the practice, as they will enable us not only to form a more correct idea of the state of the whole discovery, but also assist us materially in deciding the extent of the antivariolous power of vaccination.

I.—*Source of the Vaccine Affection.*

Dr Jenner, most unfortunately in my opinion, introduces his subject with the ob-

servation, that the human species are subject to many diseases, from their domestication with other animals. It was impossible that the Doctor could mean any accidental affection; such as rabies canina, or any other disease, or distress, proceeding from wounds, bites, or ulcers, produced from having contact with their sores, or from their being capable of exciting a variety of distressing affections from terror. He unquestionably conveyed the idea, that we were liable to be influenced by many diseases to which they might be subject, by their acting from contagion.

I am warranted to conclude, from the authority of the whole College of Physicians in London, and I believe I may add elsewhere, that there is no foundation whatever for this insinuation; for it is expressly allowed, that there is nothing analogous to it hitherto known. Whether the Doctor, therefore, dropt the idea from mere inatten-

tion and accident, or from a design of making such an unheard-of proposal glide more easily down, I shall not pretend to say ; but certainly, as the subject now stands, when every phenomenon belonging to it is enveloped in doubt and contradiction, we are warranted in entertaining the opinion, that Dr Jenner himself was not exactly at rest upon the subject.

In his first publication, he suggested the probability of the vaccine affection being derived from a matter discharged from the heels of horses, in a state of disease called grease; and brought forward, in proof of this, several cases, where security against variolous contagion seemed to be imparted. He also stated others quite of an opposite tendency, where the small-pox succeeded to the equine affection, in a greater or less extent, and seemed inclined on the whole to conclude, that it was not of equal efficacy with the vaccine affection.

In an after publication, however, he seems rather to think them the same, and endeavours to reconcile this difference of opinion by stating, that the virus changes its quality from various causes, so as to have lost either entirely, or nearly, all its antivariolous power, or to have only produced local effects.

This opinion was supported by Dr Loy, by a series of experiments, and it was contradicted by Drs Pearson, Woodville, and others. It seems now, however, to be the most prevailing opinion, that this matter from horses heels is really the source of the vaccine disease, and equally capable of producing the antivariolous process; and I confess, from every thing I have read on the subject, I am inclined to think it distinctly ascertained. If this is the case, it ought now to assume the title of the equine or horse-pox; and the name of cow-pox stands in the same predicament, as if it were

to receive its name from the human species, or any other animal it was applied to by inoculation.

Those, however, who contend for this source of the disease, require, that the virus must be in a particular state, which can only be found at a certain stage of the disorder, and, if used in any other, it will not communicate the antivariolous power to the constitution.

Here, at the very outset, we meet with the most glaring uncertainty on a very important and fundamental point, and a principle started of such uncontroled and extensive application, as to be capable of defeating every species of proof that could possibly occur, inimical to the practice. Indeed, so sensible do all vaccinists seem to be of the great delicacy of this part of the subject, that they seem from *sympathy* inclined to draw a veil over it, for the ultimate safety of the whole practice.

We may however observe, that it is not a little remarkable, if this equine virus should possess the power ascribed to it, that the effect should be confined entirely to so small a district of country, when it is known, that the original disease exists over the whole of Europe, and perhaps the globe. It is farther to be remarked, that the phenomena of the disease of grease affords no reasonable foundation for ascribing to it such powers. So far as our experience goes, it seems produced by no epidemic, is incapable of communicating itself by contagion, either to other horses, or to the human species; it even does not seem to possess much activity, for its effects are most undoubtedly rare in proportion to its frequency; and the disease is attended with no other eruption, or external appearance, and certainly bears not the smallest resemblance to the vaccinæ vesicle, whether produced casually, or intentionally; and none of the circumstances, except in the

mere production of the vesicle, have the smallest affinity, or resemblance to small-pox : to all these we may add the fact, that many cases have occurred, where the disease from this source failed to give the smallest security.

From these circumstances I think we are warranted in concluding, that if this matter of grease possessed such properties, we must, from the universality of its existence, have become long ago acquainted with the fact ; and also, if it is really the source of the vaccine affection, and equally capable of producing the disease, we have no reason, either from its phenomena or effects, for concluding, that it can impart any security against variolous contagion.

II.—*The Origin of Vaccination.*

The Doctor states, that he was led to the discovery, from the well known fact in Gloucestershire, that those who had undergone

a disease known by the name of cow-pox, were uniformly considered as for ever free from the influence of small-pox. Here however, unfortunately, the Doctor is not void of contradiction and difficulty, for it happens, that, in inquiring into the truth of this general rule, he meets not only with many cases where they have suffered an attack of small-pox, after having gone through the casual disease, with constitutional symptoms; but also, that such an idea of security was of very late date; that many of the old farmers never heard of such an opinion; and that all the surgeons to whom he applied in that neighbourhood, contradicted such an idea on the score of experience.

The Doctor endeavours to get over these difficulties, by finding out, that there are several other eruptions to which cows are liable, which may be readily mistaken for cow-pox. Here again the Doctor meets with the most irresistible opposition, and is obliged to

confess, not only that these different species of vesicles are often not to be distinguished from the vaccine, but also, that there are many well authenticated cases, where the genuine disease had failed to give security.

One source of relief still remained ; it was now found that the matter in the genuine vesicles might have undergone such a change, as either to contain no vaccine virus, or at best but little, and that so much weakened, as not to impart any, or at best an imperfect security, against small-pox. This change was said to be effected, when the virus in the vesicle lost its fluid and limpid appearance, and became more and more inert, as the vesicle decayed ; and in its last stages conceived it to be totally unfit for use, either from its viscosity, or purulency.

Here I dare say the Doctor thought himself *impregnable*, but experience has proved him miserably deceived ; and all former *ab-*

surdities and *contradictions* were swallowed up in the opinion started by Mr Bryce, who gravely asserted, upon the most positive facts, that the scab was equally capable of giving the genuine, and constitutional disease, with the most limpid virus, and superior to it when viscid, and somewhat opaque.

In answer to these reasons of the Doctor, it may be first observed, that it is by no means a slight objection to any practice, if it is attended with so many doubtful circumstances, as to render it not a little difficult to arrive with any precision at the ascertaining the existence of the real disease. Besides, it by no means appears, from the consideration of the phenomena, as they are now more clearly understood, that the characteristics of the vesicle are to be depended upon. Also, it is to be observed, that the number of cases which the Doctor brings forward, in favour of its resisting the variolous contagion for any length of time, are by no means so

numerous, as that the cases of an opposite tendency do not form a very serious contrast; for it is to be particularly remarked, that in such an extent of country, and where the practice of milking appears so universal, so few well-authenticated instances can be found of permanent security being afforded, as not perhaps to exceed a hundred. For these reasons, therefore, it is difficult to conceive, that if it really possessed this power, it would not have been more generally remarked, as abundance of instances could not fail to have occurred, all over the world.

I shall pursue this subject no farther at present, but content myself with observing, that it appears to me an unwarrantable conduct, in inquiring after truth, to produce circumstances, and theories, by which every possible case that can militate against the practice must be defeated, and all attempts at a fair and philosophical inquiry rendered abortive.

III.—*Is Vaccination the same with the Casual Disease?*

Dr Jenner next proceeded to realize all his conjectures, by introducing the vaccine virus on the point of a lancet, in the way of inoculation, from which a vesicle was produced, characteristic not only of cow-pox, but having such a resemblance to small-pox, as immediately to impress the Doctor's mind with the attainment of his labours. This was farther confirmed by reinoculating them with small-pox virus, and exposing them to the epidemic; both of which they were found to resist. The only differences to be observed between the disease communicated by inoculation, and casually from the cow, were, that the vesicles are less in size, and the effects produced upon the system are not only much less severe, but in general not perceptible. Still, however, it is asserted, that it is attended with the same security as from the casual form of the disease, and

is found to resist the usual tests. No eruption was found to take place over the body, no danger found to accompany the disease, and no bad consequence to follow it. From such a character, it was soon submitted to the most extensive trials, and found to answer the account given of it by the author. Such was the industry used by practitioners in general, that more have been vaccinated in eight or nine years, in this country, than were inoculated in nearly a century; and upwards of a hundred thousand have been made to submit to inoculation after having been vaccinated, and a great number were also freely exposed to infection.

From such positive testimony in its favour, every liberal mind could not hesitate to assent to, and adopt it; and all openly, or tacitly, acquiesced in this truth, that, whatever power casual vaccination might have, it was evident that, in the way of inoculation,

or, as I have always used the term, vaccination, it imparted a perfect security, and shielded the constitution as completely against the variolous influence, as the small-pox itself.

Although I admit that this conclusion was nearly fully warranted by the tests, yet I contend, that the other contradictory circumstances attending the history of the affection, ought to have excited a degree of doubt, and checked our ardour, in the universal propagation of a practice, so opposite to the laws of nature, and the animal economy,

IV.—*The State of Vaccination when first introduced, compared with its present situation.*

Upon the introduction of the practice by Dr Jenner, a description was given of the vaccine vesicle, and the phenomena attending it, which was not only at that time deemed sufficient by himself, but also for

some time after by others, to characterize and distinguish, not only its local existence, but also of its having exerted its antivenereal influence. In addition to this facility of ascertaining the existence of the disease, in the author of the practice, and other writers upon the subject, such was the opinion entertained of the simplicity, and certainty, of propagating the disease, that it was recommended to put the practice, even into the hands of *clergymen, and females*, in order to secure more rapidly to society its beneficial effects.

But not only were the characteristic phenomena, and existence of the disease so easily understood, but also it was stated by the Doctor, that constitutional influence did not seem necessary ; for that constitutional symptoms were merely the effects of local irritation from the vesicle. It was also gravely declared, that the same constitution was liable to repeated constitutional attacks

of the disease, and that, although those who had undergone vaccination, resisted the effects of variolous contagion, yet those who had been subjected to small-pox, did not resist the vaccine influence.

Whether it was observed, that some of these phenomena were quite irreconcilable in point of theory with the pretensions of the new discovery; that some cases were dropping in of a contradictory nature; or that experience obliged us to add several new, and important circumstances, to the history of the disease, I shall not pretend to determine; but in a few years after the introduction of the practice, a genuine, and spurious; a regular, and irregular; local and constitutional vesicle, were found absolutely indispensable; not only did vaccination resist small-pox, but small-pox resisted vaccination. Vaccination was found to be capable of being communicated only once constitutionally, and that every other instance

must be local. That cow-pox was the primary disease; that small-pox was only a modification of it; and that it was capable of subduing the influence of variola, although previously exerted.

As we will have occasion, in another place, to attend to the variety, and confusion, which accompany the characteristic phenomena of the disease, as well as the doubt which attends the knowledge of its local and constitutional effects, we shall proceed to notice the few remaining peculiarities, which the vaccinists afterwards contended were uniform results of constitutional vaccination.

V.—*Does Small-pox resist Vaccination?*

Dr Jenner unconsciously created a most serious objection to his new discovery, in his first communication to the public, by acknowledging, that although the constitution, after having been vaccinated, was se-

cured against the influence of small-pox, yet still a person who had undergone the variolous contagion, was liable to the influence of vaccination.

It was not difficult to detect the shade which this assertion threw upon the credit of the discovery ;—a very partial observer would naturally require, that the proof should in this particular be reciprocal. Accordingly this was in a short time readily given up, and the fact stated to be (notwithstanding symptoms denoting a constitutional derangement were allowed to have been present), that such affections were merely local.

From every proof which this point has yet been capable of, it would appear, both upon the authority of Dr Jenner and others, that many cases have occurred where vaccination has taken place in the casual way, after the occurrence of small-pox, and attended, too, with constitutional

symptoms; but they allege, that all the different symptoms were comparatively milder. Also, by intentional vaccination, the most perfect form of the disease has been produced after small-pox; but they insist, that in these particulars it does not differ from the variolous affection, as they allege it is equally certain you may obtain such appearances from reinoculation. This assertion, I can safely say, does not accord with my experience; for I have never, in any one instance of reinoculation, been able to obtain any thing like a pustule, and in general never more than an inflamed point, almost constantly beginning to decay by the fifth and sixth day, and totally disappearing by the eighth.—And in the casual way it is equally conclusive; for although the disease is universally severe, and highly epidemic, and the exposure to its local effects impossible to be avoided, yet the instances of local pustules are extremely rare, and a repetition of the

constitutional affection so uncommon, as not to afford, ever since the appearance of that disease in this country, twenty well authenticated instances. If this is contrasted with those cases allowed by Dr Jenner, and others, together with what might have been brought forward by more diligent inquiry, and these, coupled with the small portion of country in which the disease is known, it must be allowed, that the two cases do not afford any grounds for a parallel.

VI.—*Can the System be Vaccinated repeatedly?*

Here, too, the Doctor erred most egregiously. In his first publications he admitted, without reserve, that persons were again and again susceptible of this affection, and although it afforded protection against small-pox, yet it did not resist its own future influence.

It was not difficult to detect the serious operation of this assertion upon the faith of the whole practice, and accordingly it was soon retracted, and amended. It was now found, not only to resist its own future influence, but even to the same extent as small-pox, and recourse was had to those omnipotent harmonizers of discord, *local and constitutional influence*.

In objection to this amendment, we must observe, that it is impossible to grant, that at one period a disease is local, and at another constitutional, if we find it existing under all the same appearances, at each period. That Dr Jenner's cases are not only decisive of the fact, that both milkers and cows are susceptible of frequent repetitions of the disorder, with the same phenomena, but also the cows ; and it is well known that horses may have the disease over and over again. Besides, Drs Pearson, Willan, and others, proved clearly, that a genuine vesicle may be

produced repeatedly, if the operation is performed at the distance of some months from the first vaccination. I have also had frequent opportunities of observing this; and I may add, it is quite in opposition to our experience, both of reinoculation, or any information we can collect of the recurrence of the natural disease.

From these considerations we may safely affirm, that although the constitution has been influenced by the vaccine virus, it remains susceptible of not only admitting it to reproduce a perfect vesicle, but even of being affected again, and again, with such symptoms as were found to exist in the first attack, and which were then declared to be constitutional; but that it also betrays phenomena, resembling that of any other virus, having no affinity to those exanthemata, capable of exciting any permanent constitutional influence.

VII.—*Is Cow-pox the primary disease, and Small-pox merely a modification of it ?*

Dr Jenner's rage for systematizing, and giving such unlimited powers to his favourite offspring, ought to have been a great source of suspicion to every one capable of the least reflection, and should, in my opinion, have been a chief cause for renewing an inquiry, which I am afraid will end in the overthrow of all those flattering prospects, which were once, and even are still, so confidently asserted, to be the consequence of its universal adoption.

In examining the history, and phenomena of the two diseases, we can find no other reason for this conclusion, but that it seemed to resist the influence of small-pox; for whether we consider their history, or phenomena, they have not the most distant resemblance. Small-pox have been known in this country for a thousand years, and how long in other quarters of the

world is uncertain ; they are also universal ; are a disease of the most severe, loathsome, and dangerous description ; highly contagious ; and admitting of no other variety, but in the severity of their symptoms, and always retaining their characteristic phenomena.— Whether propagated by contagion, or by inoculation, they almost uniformly produce considerable fever, and other distressing symptoms, which are also, to a greater or less extent, followed with a characteristic pustular eruption. The cow-pock, on the contrary, is only known in one small county of England, and no where else on the whole globe ; although proceeding from a source, which so far as I am informed, is known in every quarter of the world. Whether casual, or intentional, it varies considerably in its local effects ; and never produces any other change upon the constitution, but what may be attributed to the effect of the vesicle ; it is also, in general, never attended with any

other eruption but what takes place from the topical effects of the virus, and cannot be propagated by contagion. In addition to these objections, there is one material circumstance to be mentioned ; that, although you can produce the vaccine vesicle in its most characteristic form, by inserting the vaccine virus taken from the human subject into the udder of the cow, you cannot produce the small-pox pustule, by introducing the variolous virus.

Some of the experiments, however, mentioned by Dr Adams, and stated in a former part of this work, would seem to give some countenance to the opinion that they were similar. I apprehend, however, it is impossible to draw any inference from those made with what he calls the pearl-pock, because it is a fact, nearly as old as the knowledge of small-pox themselves, that if you take care to expose the individual to what is called a good pock, or, in other

words, a mild state of the disease, you will almost uniformly obtain the same result; and in the practice of inoculation, I have already observed, that if care was taken to use a mild virus, you will not fail once in a thousand cases, with attention to other circumstances, to obtain a favourable result; but even here the difference is equally the same, for the variolous affection still retains all its characteristic phenomena.

Dr Adams's next experiments which bear upon the subject, refer to the principle which has been generally admitted, and so far as I know is correct, that no two specific actions can exist in the constitution at the same time.

We must first observe, that there is certainly some inaccuracy in the way in which Dr Adams has stated these results, and that it must have escaped his observation; for it is utterly impossible that he meant to convey, there could be any parallel betwixt the two

cases, of introducing small-pox and chicken-pox, or chicken-pox and cow-pox, at the same time, when no constitutional disease existed ; and introducing small-pox, or cow-pox, when the system is under the influence of measles, or chicken-pox. I should imagine the Doctor meant to state, that if we either introduce small-pox, or cow-pox, when the constitution is under the influence of chicken-pox ; or chicken-pox, when the system is under the influence of the others, that they will not proceed in their progress. If this is not the case, the first set of experiments are, in my humble opinion, wholly incomprehensible, and cannot be admitted as proving any thing. I apprehend it can be distinctly shewn, that if you puncture the body with several kinds of virus, they will all advance, until interrupted by the specific action of any one of them ; that this interruption will only take place in those pustules that are also capable of producing a

distinct specific action ; and that all the others will continue their progress to that state of perfection they are capable of acquiring.

But the Doctor farther says, if you insert cow-pox virus either at the same time, or some days after having introduced variolous, or variolous along with, or a few days after the vaccine, both diseases will go through their regular progress, no otherwise modified, but the latest pustule or vesicle being only somewhat smaller. Now this statement, together with the evidence before us from other sources, clearly shews, that the two diseases may precede, or accompany each other ; therefore, if they were of the same nature, and possessed the power of producing the same distinct specific action, we should find, according to the well known fact, that small-pox prevents its own repetition, that no such succession to each other should take place ; and also, that we must

either renounce the principle of no two specific actions being capable of existing in the system at once, or conclude, that one or other of these affections, does not possess the power of exerting any distinct specific influence.

We have the most convincing proofs of the accuracy of the principle already mentioned, in all the diseases known to be capable of exciting a specific action, and that the variolous contagion has hitherto been found to be one, that possessed it in the most complete and extensive form, and that all its characters afford the most convincing evidence of this quality. But when we inquire into the history, phenomena, and effects of the cow-pox, every thing is confused, and imperfect, and the actual existence of the disease itself characterized by no circumstance, that can give it the smallest pretensions to this quality. It is mild, and insignificant, and when compared with the disease it is intended to ob-

viate, and supplant, or with any other of the same description, it seems wholly inadequate to produce any action on the constitution, that can be considered as strongly, or permanently specific, and betrays phenomena common to the introduction of many other matters, which have never been supposed to have any thing more than a local effect. Under such circumstances, then, I apprehend, we are not warranted in rejecting an established principle, but on the contrary, we are at liberty to conclude, that cow-pox is totally different from small-pox, and that if such a connection was necessary for establishing the perfection of vaccination, it can look for no relief from this quarter.

VIII.—*Is Cow-pox capable of subduing the Variolous influence, although previously exerted?*

This was the *ne plus ultra* of vaccination; and, unfortunately for Dr Jenner, this is also

relinquished by some of its most sanguine admirers. It is now found from experience, and experiment, that it not only does not possess this power, but that the vaccine vesicle may have all its characteristic phenomena present, and still incapable of subduing, preventing, or even moderating the contagious influence of variola; and there are many cases of the vaccine vesicle going through its most characteristic appearances, after the eruption of small-pox is completed.

In addition to the light which the cases stated by Mr Bryce, and inserted in this work, throw upon this subject, I apprehend those contained in Section III. Chap. VI. are nearly decisive of the point. To them I have here to add, that soon after the introduction of the practice of vaccination, I happened to give a case of lancets to be infected from a vaccine vesicle. The whole were used, and, in one of the cases, I was surprised with a small-pox pustular appear-

ance at the arm, attended with much fever, and followed with a considerable eruption. I soon recollected that one of my lancets had been previously infected with small-pox virus, and accordingly entertained no idea prejudicial to the practice, although I was acquainted with Dr Woodville's cases. This accident naturally led me to repeat the experiment, and it has been uniformly attended with the same result from which I think we are at liberty to conclude, that as both viruses were introduced together, if the vaccine possessed any such specific power, it ought to have subdued it on that occasion. For greater satisfaction, I varied the experiment, and introduced each virus by separate punctures; the result was, that, in every case, the disease was variolous, although the vaccine vesicle had obtained, not only the characteristic appearance, but was attended in every case with a distinct areola, to its full extent, which, in many

cases considerably anticipated the small-pox pustule.

The experiments, however, of Dr Adams and Mr Bryce, upon this point, are in direct contradiction*. Mr Bryce contends, that,

* Dr Willan also mentions the result of experiments made by inoculating with vaccine and variolous virus at the same time, or at the distance of some days from each other. He says, that the result was uniformly variolous fever and eruption, and that these consequences generally ensued, even where the variolous virus was inserted a week after vaccination; but if inoculation was performed at the distance of nine days after vaccination, it produced no effect. He observes, however, that the eruption appeared modified, seldom going through the progress of a variolous pustule, and also, that the cow-pox vesicle seemed so far influenced, as to be both smaller in size, accompanied with a slight areola, and the whole of its progress impeded. Notwithstanding these appearances of modification, he allows, that still the eruption was distinctly variolous, and capable of communicating perfect small-pox, and that the vaccine vesicle possessed powers of imparting the genuine cow-pox. In addition to the cases I have given in Section III. I have since had several others. The small-pox pustule in one case preceded the vaccine by four days, and the vesicle was about the usual size, was attended with a very trifling areola, which co-existed with the variolous areola and fever; in the other two, the variolous fever and areola commenced on the eighth day, and the vaccine vesicle assumed, on the ninth, an areola about the size of a six-

if cow-pox precede small-pox, or small-pox precede cow-pox, the pustule or vesicle of

pence. The fever continued moderate for two days, and neither the areola of the pustule, nor vesicle, became larger; but on the third day, the fever, from some accidental cause, increased; the pustular inflammation now extended to the size of a penny-piece, and that of the vesicle became brighter, and was equal in circumference to a farthing. The eruption in the case where the vaccine was four days behind the variolous inoculation, only amounted to five dozen, and a great number obtained the full perfection of a variolous pustule; in the other two cases, the fever was severe, the eruptions exceeded two hundred, and went through all the stages of complete variolous pustules. From Dr Willan's account of the matter, it is evident, that the vaccine influence is at all events weak, and feeble, in its operation, and cannot controul the variolous influence, even although it has preceded it a week, but that the variolous influence is strong and perfect, and seems to subdue the power of vaccination, although co-existing. I cannot admit, from what trials I have made, of the modification of the extent, and appearance of the pustular eruption, (which the Doctor seems to consider as a general rule) if the vaccine and variolous pustules agree in the extent of their progress, or are only from twenty-four to forty-eight hours difference. It appears to me that the immediate effects, as well as consequences, are precisely the same as if inoculation had not been accompanied with the vaccine vesicle. I apprehend the progress of the pustules will be found uniformly to depend upon the number and *size* of the eruption. Neither can I agree entirely with the Doc-

the latest disease, will not run its natural course. Dr Adams, on the contrary, states, that they will uniformly do so, and be no otherwise modified, than that the latter vesicle, or pustule, will be somewhat smaller. It is not for my present purpose to reconcile these jarring experiments; it is enough if

tor, that the vaccine vesicle is no otherwise modified but in size, extent of areola, and rapidity of its progress. From the cases I have met with where vaccination in its progress was a day or two behind inoculation, there seems to be a very sensible approach in the vaccine vesicle to a small-pox pustule; it not only does not acquire its scab or crust so quickly, but even as late as the fourteenth day from vaccination, and the seventh from the formation of the areola, had not acquired a complete crust; loses entirely its vesicular appearance; becomes almost completely pustular, and its scab pale, and of a loose, irregular, and soft texture. Were the virus in this state to be used for vaccination, I apprehend that the characteristic vaccine vesicle would not only be found wanting, but that a very near approach would be made to the variolous pustule. At all events, the whole trials and experiments upon this subject, clearly point out the feeble power of vaccination, as an antidote to the variolous influence; and shew distinctly, that its specific effect is so weak, as to be entirely interrupted, set aside, and destroyed by the variolous influence.

we find the subject involved in contradiction; but I must observe, that Mr Bryce seems totally to overlook the effects of the cases contained in his publications upon the subject; for they certainly distinctly prove, that the small-pox was no way modified, although the cow-pox vesicle and areola previously existed, and that the fever, and eruption of small-pox, could not prevent the cow-pox vesicle assuming its areola, nor even giving its constitutional effect, which must be inferred, according to Mr Bryce's own doctrine, from the appearance of the areola in the double vaccination.

I apprehend it is unnecessary to prosecute this subject farther; enough has been said to expose the fallacy of this conclusion, and that we can only explain the whole difficulty, and get rid of the dilemma arising from such opposite experiments, by allowing, that the vaccine virus is either totally destitute of that power, necessary to produce

a distinct specific constitutional effect, or that it is so weak, and imperfect, as only to exert its influence in a very partial, and temporary manner.

CHAP. V.

INQUIRY, HOW FAR THE PHENOMENA OF THE
VACCINE VESICLE WARRANT THE INTRODUC-
TION OF THE GREAT VARIETY OF TERMS USED,
FOR DENOTING THE EXTENT OF ITS INFLU-
ENCE UPON THE SYSTEM.

A particular investigation of this subject seems absolutely necessary for obtaining a fixed opinion of the nature, and powers of vaccination, and also for leading us with precision, to the discussion of that most important question; what security vaccination affords to the constitution, from the influence of variolous contagion?

Before proceeding to this inquiry, it may be necessary to premise, it is admitted

by all, who have had any experience upon the subject, that in general, if, upon the introduction of vaccine virus, a vesicle is produced, characterized, as we have already mentioned, it is found, that such an effect is produced upon the constitution, that it will resist the effects of variolous virus introduced in the way of inoculation, or exposure to its contagious influence.

In consequence, however, of cases occurring, where small-pox have attacked those who were supposed to have gone through vaccination, a distinction was found *necessary*, in order to explain those cases *satisfactorily*, and which ended in introducing a variety of terms, endeavouring to convey a more correct idea of the affection.

Most authors, therefore, use the terms perfect, regular, genuine, and constitutional, in one sense; meaning to convey, that vaccination has exerted its antivariolous powers upon the system, and that the security of the individual is perfect, or as much

so as by inoculation. By the terms imperfect, spurious, irregular, or local, it was meant to convey, that, from some particular appearances in the vesicle, the antivariolous power had been either partially, or not at all imparted to the constitution.

These distinctions, in consequence of leading to confusion and mistakes, are now proposed by Mr Bryce to be done away, and the two terms of constitutional and local only retained. This, Mr Bryce contends, as both necessary and proper; those terms, expressive of the appearance of the vesicle, however accurately defined, being liable to doubt and confusion, and as all the variety of vesicles, too, have been found capable of giving the constitutional security. Besides, he apprehends, that a test can be obtained, by which it may be uniformly ascertained, whether or not the vaccine vesicle has exerted its antivariolous powers upon the system; and therefore, as we are no longer dependant upon the phenomena attending

the progress of the vesicle, all its different appearances may be disregarded.

If this was really the fact, much would have been accomplished; but I apprehend it will appear, that no such test is obtained, and that the other terms to which it has been found necessary to have recourse, are still wanting, not only for characterising the varieties of the vesicle, but also as affording a *facility for explaining* away, and *defeating* every objection that can possibly come against it.

As the vaccinists only contend, that the constitutional, perfect, or complete vaccination, has the power of giving protection from the variolous poison, we must, in our inquiry, attend to every circumstance, which has been found to influence the production of this state of the disease.

I.—*Virus.*

Here the author of the practice stated, that the antivariolous effect of vaccination

might be entirely defeated, by using virus in an improper state.

This assertion was supported, and confirmed in the most positive manner, by every author who wrote upon the subject ; and it was looked upon as a settled point, in the practice of vaccination, that the most anxious care was necessary in selecting the proper period for taking virus ; nay, indeed, so nice and important was this esteemed by its author, that I was credibly informed, he once restricted the period to a few hours. However this may be, it was agreed, upon all hands, that it was absolutely necessary to use the virus in an active, limpid state, and that it ought to be taken before the vesicle is surrounded with an inflamed margin, and not begun to decay ; including, in general, a period between the seventh and ninth day. That, if virus is taken when the vesicle is decaying, or in a state of viscosity, it will fail to produce the perfect disease, or, if it should succeed, it will give all

the characteristics of the affection on an imperfect scale, and to a diminished extent.

This opinion is certainly consistent with every fact hitherto known, with regard to the effects of fluids introduced into the system by inoculation. It is perfectly in unison with our former experience in inoculation for small-pox, and is also particularly so with regard to vaccination. For whoever has had but a moderate experience in this practice, would readily find, that, in proportion to his deviating from this rule, his disappointments would increase in the same ratio.

Although it is unnecessary, for the attainment of my object, to endeavour to elucidate this disputed point, yet, as it does show to what an extent the difference of opinion may really extend, and how fond the human mind is of invention, I shall bestow a little more attention on the subject.

Mr Bryce claims the *merit* of dissenting from an universally acknowledged fact, not

only with regard to vaccination, but, I will venture to assert, every specific virus what ever. This, too, he does with the full conviction, of the great delicacy and niceness of distinction, for ascertaining the perfect or constitutional disease, and with a thorough sense of the importance of using virus in a limpid state. The substitute he recommends for limpid virus, is the scab which remains after the disease is finished upwards of ten or twelve days, and which, he says, may be used for giving the perfect vesicle, many months after.

Independent of all reasoning upon the subject, I must assert, that either Dr Jenner and his followers are all wrong, or that Mr Bryce's substitute is not to be trusted. It is evidently a most palpable contradiction; and if it is really true that it does give the perfect vesicle, and constitutional disease, then all Dr Jenner's, and other authors facts and assertions, must fall to the ground;

that all those important distinctions, and hardly perceptible peculiarities, which are contended for, must be visionary and false ; and the whole phenomena of the disease, must be still overshadowed in mystery, and confusion.

Mr Bryce asserts, that the scab, or crust, is equally capable of producing the constitutional, or perfect disease, with the most active limpid virus ; is one of the best modes for preserving the vaccine virus fit for use, and that it is not liable to the same objections, as when in a viscid and opaque state. He contends, that the limpid fluid is entirely converted into the semi-transparent hard crust, and that a pus is formed below it, from the irritation which the scab produces on the raw tender surface, and also, that pus is frequently contained in the extremity of the circle of the vesicle, at an advanced period of the disease.

It appears to me impossible to conceive,

by any of the hitherto known laws of the animal economy, or by any knowledge of anatomy, that when a pustule or vesicle changes into the form of a scab, that this scab consists of matter, possessing stronger powers than what it retained when in a state of fluidity, even although somewhat viscid and opaque, and from which fluid, the scab merely follows as the natural consequence of acquiring greater solidity, by the processes of absorption and evaporation. It might, perhaps, have been possible to conceive, that, had the virus contained in the vesicle been found to acquire additional virulence as it became viscid, that the scab might have been still stronger ; but this is known to be quite otherwise, and, as I have already said, the laws with regard to these fluids are in perfect contradiction to it. It appears to me quite hypothetical to suppose, that the fluid in which the properties of vaccination consists, can, by some unaccountable power of attraction, or locomo-

tion, withdraw itself from the extremity of the circle of the pustule, and lodge itself in the centre, and leave nothing but pus, or inert viscid lymph, in the extremity; and this more especially, when the structure of the vesicle is recollected; for, as it is *allowed* to be formed of a number of small cells*, *even described* by Mr Bryce as resembling a *honey-comb*, an effectual bar must be presented to every such change of situation in the virus, and the virus contained in each cell originally, must remain in the same situation, and undergo all its changes. Besides, through all the preceding stages, we have evidence of the centre containing no virus whatever; for, if you attempt to open the vesicle at this point, you will almost be certain to draw blood, however careful you may be, showing that, at this point, there is really no vesicle, but a strong vascular con-

* This structure, I believe, was first noticed by Dr Cappe of York, and has been generally acquiesced in.

nection with the vessels of the surface; and, if you attempt to vaccinate with the lancet infected from this part of the vesicle, you will seldom or never impart the disease. As a proof of this, too, the centre of the scab is the last to be disengaged, the scar being always deepest in the middle; and these appearances are not merely connected with the vaccine vesicle, but with every pustule and process produced by puncture, which ends in a scab.

As to the description given of the production of pus, it would appear, that Mr Bryce hardly contends, that this appearance is general at the latter period of the vesicle, and formation of the scab. If so, it hardly deserves notice; because we uniformly find, in all vesicles, that the virus loses its powers in proportion to its period of decay, not depending upon any accidental production of pus, or any other cause. From my own experience, I can assert, that, in all those cases where pus has been particularly produ-

ced at this period, it has uniformly proceeded from an injury to the vesicle, by which it was reduced to an ulceration, and, if the scab had not then been completely formed, its appearance also was changed.

But if Mr Bryce means to convey, that pus really forms in every vesicle, towards its conclusion, at the extremity of the circle, then it is evident, there can be no just grounds for the distinction of vesicle and pustule, because it is also only in the advanced period of the small-pox inoculated pustule, that it assumes this appearance*. I apprehend, however, from Mr Bryce's anxiety in employing the terms vesicle and pustule, he means to convey, not only that there is a material difference in their structure, but also in their contents, and seems anxious to infer, that the vaccine vesicle may

* Dr Jenner and others retain the term pustule, and do not contend for any material difference in the contents of the vaccine vesicle, and variolous pustule.

possess very remarkable properties, from its very singular and uncommon organization.

I confess, however, with the most careful examination by the best glasses, and the most minute attention to the subject, I can see no grounds for this distinction, from the structure, and but very little from the contents of the two pustules.

The skin may be *safely* described as consisting of secreting, exhaling, and inhaling tubes, pointing to the surface, surrounded with mucus, nerves, and blood-vessels, over all which, the thin cuticle is expanded, and, upon being examined with good glasses, gives the appearance of cells, as it were, sealed hermetically by the cuticle *.

* Although, in a sound state of the skin, perspirable and other matters can be readily discharged through the cuticle, yet, the moment that any cause is applied, capable of producing irritation and inflammation, it immediately becomes impervious; and, if the irritating cause is sufficiently powerful, a vesicle is produced, shewing that the pores of the cuticle are so completely obliterated, as even to confine a very thin aqueous fluid.

If, upon the introduction of either vaccine or variolous virus, an inflamed point is produced, this account of the formation of the external part of the skin becomes very evident, and little vesicular points are now distinctly perceived, all separated from each other, and as yet forming no distinct vesicle, but gradually extending themselves from the punctured point, to the extremity of the inflamed spot. In a little time, generally from the third to the fifth day, these vesications become large and distinct, and unite into a cluster, forming at last a vesicle or pustule, by being considerably enlarged, and elevated above the rest of the inflamed spot. During the whole of this progress, the point where the lancet was introduced, appears not to be altered in the smallest degree, but remains, as it were, firmly tied down, by the adhesion produced from the puncture, and preserves this appearance through the whole progress of the vesicle and pustule. It is this cause

that produces the pit, or depression in the centre; it is from this point that the pustule or vesicle begins to decay, and, in the appearance of a crust, gradually extends itself over the whole. This account applies both to the formation of the vaccine and variolous inoculated pustule; and in no instance have I ever found either of them to vary, unless they had sustained some injury*.

But besides what we have already described, we shall find, that they also agree in many other respects. At no period can the virus in either of the vesicles be emptied of its contents by one puncture, and I apprehend for a very obvious reason, for, independent of the cellular structure, the centre of

* In some cases of both vesicle and pustule, (but more especially of the pustule,) where they are large, and the inflammation severe and extensive, the punctured point seems dissengaged from its situation, and they assume the appearance of a sac or abscess; but this, too, only at the latter period of the process.

the pustule, or vesicle, is absolutely obliterated, by its adhesion from the puncture, and the fluid is contained as it were in a ring; and, upon an opening being made on one side, the fluid in order to be discharged, must necessarily pass through a great portion of the circle, which is not to be so readily effected, even were no opposition made from the cells. But I apprehend it is from this very circumstance, that the vaccine vesicle is exposed to the danger of losing all title to possessing the power of exerting any extensive, or permanent influence over the system; for here it expressly agrees with every vesication produced from whatever cause. It is perfectly well known, that if such vesications are ruptured, they will continue to discharge a much greater quantity of limpid fluid than even they contained when whole; and the scab, too, that follows such affections, is always dark-coloured, shining, and hard, if they are allow-

ed to go through their natural course. The fact, too, that has been observed of the vaccine virus losing its activity, after the vesicle has discharged a considerable quantity, shews that its local effects are so weak, and partial, as not to impart a sufficient strength of organization, capable of *preserving* its specific quality.

I am of opinion, that those who made the account of the two pustules to differ so considerably, drew their conclusions, from comparing the vaccine vesicle, with the variolous pustule, produced by eruption. There the description is nearly correct, but certainly the conclusion is not warranted; for there can be no affinity in appearance, between a pustule produced from virus introduced on the point of an instrument, and one following an eruptive fever.

But if any doubts still remain, they appear to me to be entirely settled, by what we observe take place in those pustules

produced by eruption; for the circumference exactly resembles the appearance already described to exist, of that from inoculation, with the centre at first depressed, but which gradually rises, and assumes a more prominent appearance than the circumference, and seems distinctly to resemble a bag containing fluid. Also, upon laying open the pustule, the cavity only corresponds with the extent of the centre, and does not extend to the margin, or that portion of the pustule which first existed. We may besides observe, that the cellular appearance seems clearly to depend upon the extent of the inflammation; for we find that, in those secondary vesicles, which sometimes attend vaccination, they are far from being distinct, and approach nearly in appearance to the small-pox pustular eruption; for there, no central crusts are to be found, the whole fluid may be readily discharged by one puncture, and, upon remov-

ing the surface of the vesicle, a distinct cavity is found to exist.

As to their contents, there really exists, in this respect, but little cause for the introduction of a new term. The fluid contained in each has the most exact resemblance, until the ninth, or tenth day, being limpid and fluid; they soon after become gradually viscid, and opaque, and not only assume the appearance, but actually have become pustular. The only difference to be remarked is, that the inoculated pustule more distinctly assumes the appearance of perfect pus, is larger and more unequal in its figure; its extremity irregular, and jagged; its period of decay more protracted; and the scab, or crust, in general of a paler colour. We may, however, remark, that very frequently the severe cases of the one, and the mild cases of the other, so nearly approach, in every respect, as hardly to be distinguish-

ed by the most experienced inoculator *; from which it would appear, that the greater resemblance of pus, entirely depends upon the extent of the inflammation, as it is well known, that it is always much more severe, and extensive in inoculation, than in vaccination.

While I am thus so strongly confirmed in my opinion, of the scab being deficient in point of activity, I am far from asserting, that it possesses no power. Besides the ample testimony given by Mr Bryce, and other practitioners, I am also convinced, from my own experience, that it is capable of producing the regular vesicle, and perfect disease, but farther than this I cannot go. We might with equal justice assert, that the crust of small-pox is equally pro-

* Indeed, in almost every case, the pustule and vesicle resemble each other so strongly during the first six or seven days of their progress, that, although existing on the same arm, at the same time, they cannot be distinguished from each other.

per for inoculation, with the limpid virus ; because we all know perfectly, that it retains a sufficient quantity of the variolous contagion for communicating the disease. I have no hesitation in asserting, that the same deficiency of strength, and activity, will be found to attend the vaccine scab, and that it will very frequently fail, unless the mode of introduction is much more severe ; it will also only produce a vesicle, slow in its progress, smaller in its size, and with a very small, and feeble ring-like inflammation. Upon the whole, I think we are warranted to conclude, that, if the vaccine scab, or crust, really possesses the power of imparting the complete effect of vaccination to the system, to the same extent with the limpid virus, it is not only in direct contradiction to general experience, and analogy, but also clearly evinces the imperfection, and inconsistency of the whole subject.

II.—*Vesicle.*

It does not appear necessary to take up our attention, with any of the appearances of the puncture, previous to its having assumed the form of a vesicle, as they do not afford the smallest foundation for ascertaining, or characterizing the disease. But when it has gained the state of a vesicle, or pustule, it is supposed not only to be characteristic of the affection, but also to afford a distinct proof of the perfection of the process of vaccination.

We have already stated the description of the process of the punctured point, as it appears to us, and have also given an account of it, as described by Dr Jenner and others; but notwithstanding the minuteness, and accuracy, of these descriptions, and the seeming uniformity, and regularity, with which they are said to follow the introduction of the vaccine virus, yet it is on this very point, the most remarkable varie-

ty, and confusion exists; some contending for the vesicle assuming, upon every occasion, the appearance already noticed, as characterizing a constitutional, or perfect vesicle; others that this is not necessary; that every variation of size, figure, and colour is not material, if only a vesicle is formed, short of suppuration, or a pustular appearance.

It is well known, that, upon the introduction of the practice by Dr Jenner, the size of the vesicle was understood to be considerable; in most cases at least equal to the size of a seven shilling piece, the figure circular, with an edge somewhat irregular, and more elevated than its centre, and its colour distantly approaching to blue. It now appears, there is not one of these peculiarities but what may be dispensed with. The size may not exceed a split pea, the characteristic figure may be nearly, if not entirely lost, and without the least shade

of blue, and still the antivariolous power as complete, as from the most perfect, and approved form, and capable of resisting the tests of inoculation, revaccination, and exposure to the epidemic.

If we were formerly surprised with the incongruity of the opinion, that the scab, and limpid virus, are equally effectual and proper, what must we think, if, besides what has been just now stated being proved from experience, it is also asserted, that there are imperfect, or spurious vesicles, confessedly owing to no purulent matter, and that these vesicles are capable, *vice versa*, of giving the imperfect, or perfect vesicle; and farther, that even these avowedly imperfect vesicles, still resist all the common tests. But to put this part of our subject in the most conspicuous form of absurdity, and contradiction, we shall just quote a passage in the Appendix to Mr Bryce's last publication. He observes, "Although I have said that

what has been called the spurious cow-pox, and the irregular vesicles, are only local affections, I am well aware that they are often attended with fever, and other symptoms of constitutional excitement; but I am clearly of opinion, that these symptoms of constitutional excitement, are not the effect of the inoculation, but of *some* morbid action in the constitution, inimical to vaccination, and that this constitutional excitement is the *cause*, and not the *effect*, as has been imagined, of the irregularity observed in the progress of the affection at the part inoculated."

As this subject will fall to be considered in another place, we shall only just observe, that this perhaps might be all very true; but how comes it, that, if such cases were either to be submitted to inoculation with variolous virus, or to be exposed to the epidemic disease, they would be found *uniformly* to resist these tests?

Dr Willan, too, observes, "The effect of vaccination, when there are irregular vesicles, is different in different cases. They appear fully to secure some individuals from the infection of small-pox; in others the constitution is but imperfectly guarded against the small-pox by those vesicles, the disease taking place after them at different intervals, under a particular form." Again, "Imperfect vaccination is not characterized by any uniform sign or criterion, but exhibits, in different cases, very different appearances, as pustules, ulcerations, or vesicles of an irregular form. I have observed *three* sorts of irregular vesicles. The first is a single pearl-coloured vesicle, set on a hard dark-red base, slightly elevated. The second appears to be cellular, like the genuine vesicle, but is somewhat smaller, and more sessile, and has a sharp angulated edge. The third is a vesicle without an areola."

According to Dr Woodville, "Whenever

vaccine inoculation excites a pustule (vesicle) of *any kind*, though it continue but for one or two days, and should be succeeded by an ulcer, the inoculation is as *effectual* as where the vaccine tumor has proceeded in the regular manner."

It is absolute folly to pursue this part of our subject farther; suffice it to say, that the vesicle is admitted, by all who have had any experience, to be a very uncertain criterion of the perfect disease, and that the variety of the vesicles do not, from their effects, warrant the introduction of those terms, used for denoting the extent of their constitutional influence.

III.—*Areola.*

The next phenomenon which is found to attend the progress of the vaccine vesicle, was supposed to form one of the most characteristic, and decisive tests of the existence, and completion, of the process of

vaccination. When the vaccine vesicle has arrived at the eighth or ninth day, an erysipelatous inflammation begins to appear round the base of the vesicle, and this gradually increases to a greater or less extent. That portion of the inflammation which is near the vesicle, is in general of a deep red, swelled and hard, but as it extends, becomes faint, and then again, at its termination, becomes a shade or two darker. The termination of the first appearance, gives what is called the single areola, and the termination of the whole erysipelatous appearance, gives the second, or double areola. Every practitioner who has had any experience in this disease must, however, have observed, that this double areola is not even a general phenomenon, far less universal, and that the most common appearance is a mere circular inflammation; that the extent of the inflamed single or double areola, varies from the diameter of two in-

ches to that of a sixpence ; that although the erysipelatous inflammation is present to a great extent, still you may have no regular areola of any kind ; sometimes it is jagged, and irregular ; sometimes hard, and considerably swelled ; and very frequently neither of these takes place.

Dr Willan thus describes the areola which attends the *perfect* vaccine vesicle : “ The areola which is formed round the vesicle is of an intense red colour ; its duration differs in different persons, from a quarter of an inch to two inches, and is usually attended with a considerable tumor and hardness of the adjoining cellular membrane.” In the irregular, or imperfect vesicles, (which, it must be recollected, he allows are capable of protecting the constitution against variolous contagion, to a certain extent), he says, “ That the areola of the first sort is usually diffuse, and of a dark rose colour ; in the second, it is *sometimes* of a dilute scarlet co-

lour, radiated, and very extensive, as from the sting of a wasp ; at *other* times (it is of a very trifling extent and pale colour), as exhibited in (his) Plate I. No. 7." The areola, the Doctor adds, appears round the imperfect vesicles on the seventh or eighth day from vaccination, and continues for three days, more or less vivid ; he does not mention the day that the areola of the perfect vesicle appears, but, from observing that it begins to decay about the eleventh day, we must infer that it also makes its appearance about the eighth day.

The double areola, or any inflamed appearance whatever that attends this affection, has been supposed to be of a singular appearance, and characteristic alone of vaccine virus. From experiment, and the most attentive observation, I am convinced, that incidental circumstances have a great share in producing the whole of this peculiarity, and variety. The modes of per-

forming the operation by which the virus is introduced are various. If you use the mode by puncture, or a slight scratch, you will generally have a vesicle, going through its stages steadily, but not rapidly, and attended with a double areola; but if you do it by incision, a deep puncture, or several severe scratches, and at the same time using very active limpid virus, you will have a vesicle, not answering exactly the characteristic description, going through its stages more rapidly, the centre assuming a more elevated appearance, accompanied with an inflammation, giving at best only the single areola, but often not regular, always of a deeper red, jagged in its circumference, and generally attended with swelling, and hardness. Besides the influence of the different modes of introducing the virus, external circumstances have their effect; if the vesicle is frequently pressed, rubbed, or kept hot, from the child lying

too much upon it, it will also contribute to increase the inflammation.

In addition to these causes we know, that, in inoculation, the symptoms of inflammation in general run high, and you seldom observe a regular ring-like appearance; but if they should happen to be moderate, it makes so very near an approach to the appearance of vaccination, that Dr Jenner hailed the similarity, as the surest omen of his success. Dr Adams, too, in his experiments shewing the identity of the vaccine and variolous virus, clearly proves, that the areola is in a great measure regulated by the severity of the inflammation; for wherever a mild case of small-pox inoculation was produced, it made a near approach to the appearance of the vaccine vesicle, and areola.

That such accidental causes are the principal, if not the whole source of the peculiarities observable in the areola, is further

corroborated, by the appearance which is found to take place in double vaccination; for there, the single, or double areola, is uniformly distinct, but only in miniature.

We also find, that in proportion to the severity of the inflammation, a pustule, or tumor of any description, will depart more or less from a regular circle.

Whatever may be the nature of this phenomenon, or the cause of its varieties, we are still, however, positive as to one material fact, that the *same* antivariolous power is imparted by all the different appearances, and that no countenance is afforded for the introduction of such a variety of distinctions, from the actual result of the practice; for, according to every author, the areola may be either present in whole, or in part, nay even absent, and still the vaccination of the system accomplished, so as to resist every test that can be then applied.

IV.—*Constitutional Symptoms.*

If we are disappointed in obtaining satisfactory information from the circular inflammation round the vesicle, we shall receive but little additional comfort from the constitutional symptoms. At first sight, it would naturally be concluded, that if, together with the appearance of the vesicle already described, any constitutional affection, such as swellings in the arm-pit, fever, sickness and startings should occur, that the vaccine inoculation had gone to the utmost extent of its powers, and that it not only ought to be a certain criterion, whereby to judge of its having exerted its influence upon the system, but also, that this influence was complete. But unfortunately we are still in the same confusion, and contradiction, as from any other phenomena we have already examined. The most perfect form of vesicle, and areola, generally produces no such symptoms, and still the antivariolous power is exerted; again,

all the varieties of the vesicle, and areola, are found to have produced constitutional effects, followed with the same antivariolous power.

Dr Jenner, unhappily, on his introducing the discovery to public notice, made an assertion which, in my opinion, struck at its root in the most violent manner. He observed, that the constitutional symptoms which took place, either in casual, or intentional vaccination, were not owing to the exertion of any influence over the system, but merely to the local irritation arising from the inflamed vesicle. In consequence, however, of the occurrence of many cases, quite irreconcilable with this opinion, and sensible, I dare say, of the error he had committed, he found it necessary to admit the existence of a constitutional affection. From the same necessity, he was also obliged to go a step farther, and request the additional indulgence, that although it was found from experience, that a person might have the

same constitutional symptoms, arising from vaccination, repeatedly, none but the *first* were constitutional, and that all the successive attacks proceeded entirely from local irritation.

Although I have no hesitation in allowing, both the necessity, and the reality of a constitutional influence being exerted, in order to produce whatever effect it is capable of, yet still, if such concessions are to be made, and such palpable contradictions overlooked, it may be safely asserted, that such encouragement was never before afforded to any innovation, and that all the rules of evidence are winked at and neglected, merely in deference to the support it receives, from one, or two, material facts.

We must first observe, that there is no occasion for making any distinction betwixt the effects produced upon the system by casual, and intentional vaccination; as it is universally allowed by all who have either

wrote upon the subject, or had experience in this practice, that the security afforded is the same, and also, it is proved to be as complete from the vesicle, whether it produces symptoms of constitutional affection, or not*.

I do not take it upon me to say, that these opinions are correct, but that such are the result of experience ; and, notwithstanding it is acknowledged, that such is the fact, yet still Dr Jenner, and now all vaccinists contend, a constitutional influence *must* take

* Dr Jenner says, " Those persons on whom the vaccine vesicle has been excited by perfect matter, and has completely gone through the progressive stages of inflammation, maturation, and scabbing, are ever after secure from the infection of small-pox." In the year 1806, the Doctor, in a letter to Dr Willan, observes, that " Vaccination gives complete security to the constitution, when no indisposition has been perceptible throughout the whole progress of the pustules (vesicles) on the arms. I once had some doubts on this point, but I am now, and have been for many years past, perfectly convinced they were groundless." Dr Willan also says, " During the progress of the vesicle, some symptoms of disorder take place in the constitution, but they do not always occur, nor are they deemed requisite to insure the full effect of vaccination."

place, in order that the individual who submits to the practice, should be put in a state of perfect security.

The dilemma, therefore, appears to be, not that constitutional symptoms must be obtained, to render it capable of giving security, but that, as such security is given from the other phenomena of the affection, how are we to come at the knowledge of its having taken place?

V.—*Tests of Constitutional Vaccination.*

We have already seen, that it cannot be from the leading phenomena of the disease itself; accordingly, revaccination, inoculation, and exposure to the effects of the variolous contagion were had recourse to. From the first test, nothing was produced but doubt and uncertainty, and considerable danger was even incurred, of bringing the practice into contempt. From the others, the whole props of the discovery were ob-

tained, and the greatest satisfaction universally imparted. The result of these proofs were, that they uniformly resisted inoculation, and the contagion of variola could exert no effect upon them.

As we shall have occasion to resume these points in another place, I shall only at present observe, that these tests were at the introduction of the affection found, almost uniformly, to follow from every vaccination, where a vesicle was produced, with more or less of the characteristic appearances described by Dr Jenner, and deemed a sufficient proof, not only of its having exerted its constitutional influence, but that this influence was complete. This point seemed to be entirely put to rest, by the immense volume of evidence brought forward; and the characteristic phenomena of the disease were so well understood, as to supersede every other trial. A few years, however, had scarcely elapsed, before cases occurred,

which rendered it necessary to investigate the subject more closely; it was found *requi- site* to throw considerable doubts upon the phenomena of the disease, and that nothing short of a distinct constitutional influence would afford perfect security. To recur to any of those tests already practised, would certainly appear absurd, and, if used at the same period after vaccination, could afford no better proof.

In this state of things, an *éxpedient* was proposed by Mr Bryce, which should effectually banish, not only all doubt about the constitutional influence having taken place, but also, that it was exerted to the extent necessary for imparting, the required security against variolous contagion *.

* Mr Pearson, surgeon to the Lock Hospital and to the Public Dispensary, mentions, in a letter to Dr Willan, that “ In the early part of the year 1801, I ascertained, that if a second inoculation with vaccine fluid be performed on the sixth or seventh day, a pustule (vesicle) will arise, which proceeds in the usual manner, until the efflorescence appears

Mr Bryce revived, and applied for this purpose, a well known fact in inoculation ; that if you puncture the skin with a lancet infected with the same virus, some days after the first inoculation, if the first produces the disease, the others will rapidly advance, and gain the same maturity as the first, only in every respect less extensive. In repeating this experiment with the vaccine virus, the same result follows ; and a vesicle is produced, having all the characteristics of the original puncture, but only on a much smaller scale. This phenomenon, Mr Bryce contends, is a certain, nay indeed

round the pustule (vesicle), produced by the first inoculation ; and that, as soon as this takes place, the second pustule (vesicle) begins to fade, and two or three days afterwards disappears altogether. On mentioning this as a test of the specific action of the vaccine fluid, it was suggested, that a proposal of this kind might diminish the public confidence in the new inoculation, in which I acquiesced, but the fact may, however, be worthy of record." This description of Mr Pearson's double vaccinations does not at all correspond with Mr Bryce's, and seems directly to militate against them.

the only criterion of ascertaining, that vaccination has exerted its influence completely upon the constitution.

If double vaccination really exclusively possessed this property, it ought to be certainly universally practised, but I am afraid, upon examination, it will be found to have no better pretensions, than can be afforded from the phenomena we have already examined.

Independent of every other consideration, it is to be observed, that such a proposal carries, upon the face of it, that some doubts hang upon the practice; and besides, this second, or even treble vaccination, is not a proof that will be always submitted to by the parents. But it is also to be particularly remarked, that as the secondary vaccination may fail, and the first vesicle go through the regular course, you deprive the parent of complete satisfaction; for it is contended by Dr Jenner, that it is not possible to pro-

duce another constitutional vesicle, and of course, you cannot afterwards procure the test required, although you should submit to repeated vaccinations.

Besides, it appears from Mr Bryce's cases, that, unless the secondary vesicle has been sufficiently advanced, it cannot be made to assume the appearance of the regular vesicle, or areola, even although the primary one has not yet previously acquired its areola, and not even after it has taken place, although accompanied with constitutional symptoms.

But farther, from the examination which has already taken place, of the proofs afforded from the vaccine phenomena, of the antivariolous process having been effected, it would appear, that all the phenomena of the regular vesicle, and constitutional symptoms, may occur repeatedly in the same person: that even in the primary vesicle, this may be obtained, without the existence of

the areola, upon which so much stress is laid, even in the secondary vesicle; and surely Mr Bryce cannot say, that he is able to obtain from the secondary vaccination an areola, if it does not exist in the primary. But again, from the cases brought forward by Mr Bryce, it would appear, that this areola, attending the secondary vesicle, may exist without the smallest evidence of any constitutional symptoms. Also, in all those cases, which according to Willan, Ring, Bell, and almost every other writer, are denominated, irregular, and imperfect, it will be found, that the vesicle and areola will be rapidly produced in the double vaccination, if the vesicles are only accompanied with an areola of any kind*.

* Dr Willan observes, "That this test of double vaccination will fail, if the fluid employed for the second puncture be taken from the person's own arm, when the vesicle is one of the irregular kind, which produces disorder of the constitution, but affords only an imperfect security against small-pox." We cannot resist this opportunity, of putting the

We shall afterwards find, that Mr Bryce will not allow of a weak or modified action of the antivariolous powers of vaccination, but contends, that if it does exert a constitutional effect, it must, in every instance, be perfect and complete. Dr Willan, as well as many others we have seen, grant, on the contrary, that certain states, and appearances of the vaccine vesicle, give only an imperfect security, and allow of a recurrence of small-pox. Mr Bryce, therefore, having obtained the test of double vaccination from *all* appearances of vesicles and areola, must either give up this favourite improvement, or maintain that these vesicles are all *perfect*, and the constitutional influence imparted. On the other hand, Dr Willan, not being able to deny the test of double vaccination, and

attempts to reconcile the most opposite facts, and opinions, in the most conspicuous point of view, and to show, that the abettors of the practice are more *anxious* to preserve consistency, than to *elucidate* the subject.

having already *distinctly* allowed an imperfect, or incomplete antivariolous influence, must either give up such an opinion entirely, and, along with it, a powerful, and ready excuse for every failure, or find out an expedient for reconciling two such opposite assertions; accordingly, at page 79, he gives the paragraph we have already noted, and seems willing to meet Mr Bryce half way. Mr Bryce, however, does not seem inclined to accept of the compromise, and requests to know, whether this declaration of the Doctor's, be merely a consequence of the *theory* which he has formed regarding the constitutional action of irregular vesicles, or as a fact founded upon the Doctor's own experience? From the opinion I entertain of Dr Willan's discretion and judgment, I apprehend it is a question he will not attempt to answer; and I am afraid it is a request which Mr Bryce would have done well to have avoided, if he was anxious for

maintaining the character of vaccination in any *decent* state of consistency.

But there is a curious circumstance, stated by Mr Bryce, as having been observed by Mr Gillespie, which, if it was to be taken as a general appearance, in such circumstances, would not only throw a farther obscurity upon this test, but also go a great way to shake the whole history of the disease. He says, that a child was vaccinated, as usual, in the double form, but, previous to the existence of an areola, in either of them, the child sickened for two days, and an eruption of small-pox followed. After the sickness and fever went off, both the vesicles became inflamed, and had each an areola at the same time. It is only necessary for our present purpose to observe, of this case, that, in those secondary areolæ, formerly alluded to by Mr Bryce, they did not exist at the same instant with the primary one, but followed at the distance, at least of twenty-four, or thirty-six

hours; here, however, although kept in their previous state by the variolous fever, they both assumed the areola together.

Mr Bryce also mentions another circumstance, which appears to me to throw no small doubt upon the accuracy of this subject; for I apprehend it is quite contrary to all experience, at least I can safely say, it is in direct contradiction to mine; he says, that if any accidental cause should occur, capable of exciting fever, or disordering the system, such as teething, that the progress of both vesicles will be interrupted. Now, I apprehend, it will be found both in vaccination, and inoculation, that if feverish heat is excited by any cause, not capable of producing a distinct specific influence, it will unavoidably quicken the progress of both vesicles, and pustules*.

* This cause is neither noted by Drs Jenner nor Willan, as preventing the regular progress of the vaccine vesicle, and it is observed by other practitioners, that the disease may be satisfactorily obtained during dentition.

If we consult analogy, too, upon this point, we shall find, that if the body labour under any feverish paroxysm, even in cases of the attack of any of the exanthemata, should there happen to be at the time any wound, scratch, or puncture, it will instantly inflame, and acquire an areola, more or less distinct, in proportion to the nature, figure, and size of the part affected; or if you puncture, or otherwise wound any part of the body, while in a feverish state, from any accidental cause, there will be produced, in a short time, even within a few hours, an inflamed painful tumor. If, while the system, too, is deranged from the effects of an accidental tumor, whether necessarily ending in suppuration or not, if you wound any part of the surface, it will frequently produce an inflamed appearance, directly. I have also often observed, in certain states of the constitution, where a hard, and severe inflamed tumor took place, that it was

frequently followed by a number of others, all arriving more rapidly at their height.

I apprehend, from an attentive review of these, and every other fact connected with vaccination, it will distinctly appear, that, as this test can be obtained in a variety of circumstances, where it has *never* been supposed that any specific constitutional influence was exerted, it cannot be depended upon, as indicating any action of the system, by which it may be inferred that an active, or permanent influence, has been imparted. At all events, it cannot be considered as better, than what can be obtained from the characteristic phenomena of the vaccine vesicle itself, and is not entitled to more attention, than where the areola exists in the primary vesicle; for, as I have already observed, I apprehend even Mr Bryce will hardly affirm, that he has ever seen the secondary areola, without its having

previously existed in the primary *. If this is the fact, which I presume it to be, both from what is stated by Mr Bryce, and from my own experience, we have an equally certain criterion, without this additional trouble, and without, too, throwing any doubt, or stigma upon the disease.

What then is to be done? are we to have recourse to revaccination, or inoculation, some weeks or months afterwards? From what has been already noticed, it appeared, that the vaccine vesicle can be produced over, and over again, and even is allowed by Dr Jenner

* We may here, too, observe, that in all those cases, where vaccination and inoculation have coexisted, and where the vaccine vesicle had not acquired its areola previous to the existence of fever, and the small-pox areola, that the vaccine vesicle immediately obtained its areola, after the areola from the inoculation, and afterwards exactly corresponded, in duration and extent, with the variolous; from which it would appear, that the specific variolous action quickens the progress of the vaccine, and that the areola of the cow-pox vesicle is merely indicative of its local influence, and is subject to the same laws with any other pustule, or tumor, that may accidentally exist, while the system is under any febrish influence.

to be attended with constitutional symptoms repeatedly. My experience on this point enables me to say, that if you revaccinate some weeks or months, after having in the first instance produced a vesicle properly characterized, I have seldom or never been able to produce it again; but if you delay it for a year or two, you will readily succeed in producing the perfect vesicle. I must, however, confess, I have never seen it, in any of those instances which I have hitherto met with, attended with a large and distinct areola. I have, however, never vaccinated any after this period; and it appears to me highly probable, that if it was delayed some years longer, all the other appearances might be regularly obtained, as we find Dr Jenner allows, that, in many cases where vaccination was reproduced casually, all the phenomena of the disease were present.

From these circumstances, then, I apprehend it cannot be contended, that this is deserving of any attention; inoculation is the only thing we can fly to; it gives neither more trouble, nor pain in the operation, and if the virus succeeds in producing an inflamed point, which afterwards arrives, in from five, to seven or eight days, at an inflamed tumor, it is an equally strong proof of the variolous virus having exerted its local influence. Besides, it would have produced the variolous disease in its usual form, had it not been anticipated by the effect of the vaccine virus on the system, and therefore it affords, not only the test, that the previous vaccination had been constitutional, but also, that it really resists the effects of the variolous influence, from which all concerned will derive greater confidence, and satisfaction. I apprehend, from the whole of what we have now said, it will clearly appear, that, notwithstanding

all the variety of the vaccine phenomena, still the antivariolous effects are exactly the same; that what has been called the tests of constitutional vaccination having been imparted, are no better than what can be obtained from the characters of the disease itself; that there really exists no foundation whatever, for the introduction of those numerous and intricate distinctions, as conveying a more correct idea of its extent, and efficacy; and that they only afford a very great facility for *evading* the force of every objection, or fact, that can possibly be brought against the practice.

CHAP. VI.

CASES.

SECT. I.

Cases of Small-pox succeeding to Vaccination.

CASES I, II, III, AND IV.—JUNE 1808.

IN the month of June last, I was desired to visit the child of a very respectable butcher in this place, about three years old. I found it covered over with an eruption, attended with considerable fever, which, the mother said, had much abated since it made its appearance. The eruption had then only been out two days, it had not the appearance of chicken-pox, and wanted some of the characteristics of

small-pox, such as the depression or pit in the centre, had little or no inflammation round the base of the pustule, and were prominent and small. The child having been vaccinated by myself, in the most perfect form, both from my own recollection, and from what I had expressed to the mother, I inclined to give my opinion, that it was not the small-pox. The pustules, were about two, or three hundred in number, and decayed about the fifth day. Upon farther inquiry, I found the small-pox were epidemic almost next door, and that several children were then ill of that disease. The opinion I had given was soon overturned, and I was under the disagreeable necessity of acknowledging it to have been a case of small-pox, for, in about eight days after, another of the same family, about six years old, became sick; in a few days a copious eruption made its appearance, which, upon a mode-

rate computation, might exceed a thousand pustules. In this case, the disease went through its most regular form, the pustules did not decay until the 7th or 8th day, and the blains upon the face did not disappear for many weeks. In a few days more, a girl about five years old became sick, and went through the disease, nearly in the same form as the last; and a fourth, about four years, was so sick, as to keep his bed for several days, but no eruption made its appearance, although there was a rash for about twenty-four hours. There was another child in the family, about ten months old, but no effect was produced upon it. The whole five had been vaccinated by me when about the age of three or four months; they had the disease according to my own recollection, and also from my opinion expressed to the mother at the different periods, in the most perfect form; and lancets were infected from all of them. The cica-

trices are all large and distinct. The family consisted of other two children, who had been inoculated, but had not the smallest complaint.

CASES V. AND VI.—JULY 1808.

In the beginning of July last, having heard that one Gibson, a fisher in Musselburgh, had a child affected with small-pox, after having been vaccinated, I called, and found his son John, aged three years, with matured pustules, to the extent of five or six hundred. It was then about the eighth day, and they were just begun to decay. He sickened a day after a younger brother, aged sixteen months, who died of the disease, but was not vaccinated. John had been four times vaccinated about six months old, until it succeeded, by practitioners in this place, and the fourth time was followed with a perfect pustule, and the most regular form of the disease, according to the

opinion of the medical attendant. The mother still describes the vesicle to have been large, the inflammation equal in circumference to a penny-piece, and the cicatrix is still very large. The small-pox were epidemic all round, and no chicken-pox heard of at the time. Henry Gibson, of the same family, now aged seven years, was vaccinated when about five months, and it was again repeated when seven, in consequence of its failing, and, although done in two places, the pustules were so small, and the inflammation so trifling, as to make the practitioner in attendance suspect, that he had not undergone the perfect form of the disease. There are, however, two distinct, though small cicatrices upon the arm. When about three years old he sickened, and had so copious an eruption of small-pox, as even now, at the distance of four years, to be much pitted; he was infected

from an older brother, who died of the disease.

CASE VII.—JULY 1808.

George L——, Musselburgh, about seven years of age, was vaccinated by Mr Stewart, surgeon in Kelso, when some months old, who expressed himself perfectly satisfied of its being the genuine form of the disease; and, from the appearance that the mother describes the vesicle to have assumed, and its corresponding with that of her other two children vaccinated since that period, together with the usual cicatrix, there can be no doubt of his having undergone vaccination in its usual and proper form. He was attending school when he sickened, about the end of July, and after three days of excessive sickness, attended with strong symptoms of exanthemata, an eruption made its appearance, to the extent of at least two hundred pus-

tules, which continued to maturate until about the sixth day, and then rapidly decayed *. He was attending school; the small-pox were epidemic in the neighbourhood; and no other eruptive disease was then known. The other two children, both younger than himself, did not complain in the smallest degree. There were several

* The following description will answer for the whole of those cases, where the pustules decayed by the fifth or sixth day. During the first three days, they had all the characters of a perfect small-pox pustule; were hard, globular, and inflamed, gave a distinct round feeling under the finger; in most of the cases, the pit, or depression in the centre, was evident, but in others, where the eruption was smaller, the depression was wanting. Upon no occasion was there the smallest watery vesication, like chicken-pox, and no matter was formed before the third or fourth day. Upon all occasions, where the eruption exceeded some dozens, they became less or more pustular, and always a certain number upon the face and trunk of the body, were distinctly so. After gaining this state, they then rapidly decayed, and scabbed; the scab was uniformly round, generally hard, and dried off, in the most characteristic form of small-pox, but more quickly. In those cases where the number did not exceed a dozen or two, they never became pustular, but remained hard, red, and papular, and decayed without leaving a scab.

more children in the family, all older, who had undergone inoculation, but none of them complained, or had any eruption.

CASE VIII.—JULY 1808.

Hugh Peacock, Musselburgh, now six years old, was vaccinated by me, when about three months. From my own memory, the mother's report of the appearance of the arm, lancets having been infected by me, and also by another practitioner in Musselburgh, (who was attracted by the very beautiful appearance of the vesicle and areola), and from the appearance of the scar, I have no doubt of his having undergone perfect vaccination. He sickened in the end of July, which continued severely for three days, attended with delirium, and great appearance of convulsions. These were succeeded with an eruption of from two, to three hundred pustules, which did not arrive at complete maturation.

tion until the seventh or eighth day. The small-pox were prevalent all round, and two or three had died in the immediate vicinity. He did not attend school, but went about the streets with his companions. He had a sister in the house, who was then aged three years, that had been also vaccinated by me; she had not the smallest complaint. There were other four children in the family, who had been inoculated, but they had no complaint whatever.

CASE IX.—JULY 1808.

Walter Ritchie, Musselburgh, about five years and a half old, was vaccinated by me when about the age of five months. He went through the disease, in my opinion, expressed at the time, in the most perfect form. The mother remembers the vesicle to have been much inflamed; the scar is still quite distinct, and several children were vaccinated from him. He was at-

tending school, where many had taken the natural small-pox, and, about the end of July, sickened; he continued so for three days, when an eruption followed, to the amount of two or three hundred pustules, and arrived at maturation in about the fifth, or sixth day, and then rapidly decayed. There were other three children in the family, all younger than himself, who had been all vaccinated successively, about three or four months old. None of them were in the least affected. There was no eruptive complaint of any other kind, epidemic at the time.

CASE X.—JULY 1808.

I was requested to visit a son of Mrs Stirling's, midwife in Musselburgh; he was about nine years and a half old, and was then confined to bed with every symptom of a smart fever, which, after continuing two or three days, was followed with an

eruption, to the extent of four, or five dozen of pustules, which continued to increase until about the fifth or sixth day, and then decayed. The small-pox were epidemic in the neighbourhood, and he attended school, where a considerable number had been affected with the natural small-pox, and some had died. No chicken-pox, or other exanthemata, existed at that time. He had been vaccinated, when a year and a half old, by the late Mr Corbet, surgeon in Falkirk, who, as well as another practitioner in the same place, that saw the arm, were quite satisfied of its being the most perfect form of vaccination, and both infected lancets from the pustule. The mother says the arm was very much inflamed, and the cicatrix is still very large. The family consisted of other three, older than himself, who had been all inoculated, but had not the smallest complaint.

CASES XI. AND XII.—JUNE, 1808.

Hearing that John Baux, a labourer in East Duddingston, had four children affected with natural small-pox, and that two of them had been vaccinated, I determined to call and inquire into the fact. I found them all four evidently labouring under that disease, in different stages. The two that had been vaccinated were a boy and girl, the oldest seven and the other five; the girl had been vaccinated by Mr Newbigging about nine months old, and the boy by a practitioner in Musselburgh when about seven. From the report of the mother, they were both satisfied at the time, and lancets were infected from one, if not both. The girl was vaccinated with the same virus, which Mr Newbigging used for infecting another child, and at the same period, as the mother of the girl was nurse to the child. The scars from the vaccinations are

also very distinct. The eruption upon both exceeded a hundred or two, and decayed about the fifth day. They were both extremely sick, but had no convulsive affections. The other two had the eruption to a greater extent, in point of number, but escaped with the same sickness. They were both younger than the two that had been vaccinated, and had the disease before them. This was about the end of June; the small-pox were then raging in the village, and had carried off three or four children.—The disease was introduced by one family, about the middle of May.

CASE XIII.—JUNE, 1808.

In consequence of the same information with the preceding cases, I called at the same time upon the family of John Eal, labourer in the same village. I found five children, in all, had the small-pox, and were then nearly over with them. Only one of

this number had been vaccinated, which was done by me when she was about nine months old, has now a very large cicatrix, and the mother says that she distinctly recollects its being severely inflamed, and that I expressed myself well pleased with its appearance. At this period she was now six years old, was attending school, and sickened before any of the family ; had a very considerable number of small-pox, which went through the regular course of the disease, and now has left a great number of pits. One of the other three sickened the day following, but the other two, not until eight days after.

CASE XIV.—JUNE, 1808.

I also attended the family of John Wood, in the same village, who had two children vaccinated by Mr Gillespie, surgeon in Edinburgh, about the month of March. About the end of June following, one of them, aged two years and a half, sickened, had

three distinct convulsions, and in about the end of two days, extreme sickness and distress, a rash made its appearance, followed with a few pustules, which kept out three or four days. The other, the oldest, did not complain. Mr Gillespie vaccinated nine or ten that day; her arm was distinctly inflamed, and the vesicle very large. The cicatrix is very distinct, and fully as much so as her sisters.

CASES XV. AND XVI.—JUNE, 1808.

Margaret Proudfoot, in the village of East Duddingston, was vaccinated by Mr Stevenson, surgeon in Gilmerton, when about three months old, who expressed himself perfectly satisfied at the time. The mother also says it was a distinct vesicle, well inflamed, and the scar is now large. In the month of June last, she fell sick, which, after continuing about two or three days, was succeeded with an eruption to the

extent of one or two hundred—they did not decay until the fifth day. She was now about seven years old, and was attending school. She had a brother now eight years, and had also been vaccinated by the same gentleman; he became sick, and continued so for two days, but was followed with no eruption. The small-pox were very prevalent in the village. The family, at the time, consisted of other two children, who had been inoculated, but did not complain in the smallest degree. Mr Stevenson also saw the child when the pustules were upon it, and said he thought it was the chicken-pox; they were not, however, known nor heard of in the village, at that time.

CASE XVII.

Elisabeth Saffley, now aged five and a half, was vaccinated from the pustule of a neighbour's child, by the mother, when about three years old. The child from

which she was vaccinated, was under the care of a regular practitioner, who declared it the genuine disease; and, from its looking so well, the mother was tempted to try it. The virus produced a vesicle, and was considerably inflamed, and has now a distinct and large cicatrix. From the month of June, the small-pox, as has been already noticed, were prevalent in the village of East Duddingston. She was attending school; she sickened, and after two days sharp fever, was succeeded with a rash, but no eruption. Previous to his complaining, a child in the same family, who was never vaccinated, became sick, and had a copious eruption of distinct small-pox. There was no other cutaneous disease known at the time in the village, and no other of the family complained in the smallest degree. They were three in number, and had all undergone the small-pox.

CASE XVIII.—JUNE 1808.

In the latter end of June, I was desired to visit the son of Alexander Carse, labourer, Niddrie-mill. I found him covered all over with small-pox of the distinct kind, of a very large size, and then about the seventh or eighth day, and just decaying. The number of the pustules must have exceeded a thousand; he was extremely sick for two or three days before the eruption made its appearance. He was then about nine years old, and was vaccinated by me when four. His arm had the usual appearance, matter was taken from it to vaccinate others, and the scar is of the common size. The small-pox were epidemic in the village at the time, and made their appearance there about the beginning of May; none had died; he was attending school. He had a sister about thirteen years old, who lived in the same house, but

did not attend the school, who was neither inoculated, nor vaccinated. She became sick in about eight or ten days after him, and went through the disease much in the same way, but to a greater extent.

CASES XIX, XX, AND XXI.—JUNE 1808.

James Muirhead, labourer, Niddrie-mill, had three children, a boy, and two girls, vaccinated by a smith six years ago, and by the description, as well as appearance of their arms, seemed to have gone through the disease in its common form. They had a daughter now aged ten, who had been inoculated when about a year and a half old, by a practitioner in this place, but did not succeed. She was also vaccinated at the same time with the other three, but it also did not succeed. All four attended the village school. The boy fell sick, and after continuing so a day or two, an eruption made its appearance, in number a-

bout a hundred; they came to very little suppuration, and decayed about the fifth or sixth day. In about five or six days after, his pustules went off; the other two sisters, who were vaccinated along with him, fell sick, but had an eruption, neither so numerous, nor so long standing. The oldest girl, who neither received the infection from inoculation, nor vaccination, escaped without the smallest complaint.

CASE XXIII.—JULY 1806.

Elisabeth Kedzlie was vaccinated by a practitioner in this place, when about three or four months old, and, according to the report of the father of the child, and also its grandmother, expressed himself at the time satisfied, of its having gone through the most perfect form of the disease. In the month of July the small-pox were epidemic in the village of Monckton, and at this time she was then four years old. She became

sick, and after continuing very feverish for some days, an eruption followed, to the extent of a thousand, or fifteen hundred pustules, which after going through all the regular form of small-pox, did not begin to decay until the eighth day.

I was called in soon after the eruption made its appearance, and although this disease was of the distinct kind, yet from the extent of the eruption, considerable fever occurred at the latter period of the disease, and not entirely destitute of danger. I desired the medical gentleman should be informed of the case, that he might satisfy his curiosity, and, upon visiting her, he was convinced of its being a distinct case of small-pox, and again expressed his conviction of her having gone through the genuine disease. She had a brother who lived in the same house, who was vaccinated also when a few months old, and was at this period two years, but was not in the least affected.

Another girl in the same house had been vaccinated twice when a few months old, without any effect, and at this period, being four years and a half old, she became sick, and continued for three days, but followed with no eruption. The family consisted of other three, who had been all inoculated, but had not the smallest complaint.

CASE XXIII.—JANUARY 1809.

Isabel Hope was vaccinated by Mr Stevenson, surgeon in Gilmerton, when about three months old. She is now near six years, and had the chicken-pox when about two years and a half. Mr Stevenson was well pleased with the vesicle, from Mrs Hope's account, and from her own memory she says, that it was a large pock, and very much inflamed, and the cicatrix is still very large. The small-pox made their appearance in the parish of Newton about the beginning of January, when several

children who attended the school were infected. She was also there, and became sick, which, after continuing two or three days, ended in an eruption of pustules, about a hundred in number. They began to decay about the fifth or sixth day. There are two more children in the family, both younger, and who have been vaccinated. None of them have yet complained. None of them attend school.

CASES XXIV. AND XXV.—JAN. 1809.

I was requested to visit the son of Mr B. farmer near Monckton. I found him labouring under the most excessive fever, accompanied with great insensibility and stupor, with some twitching of the muscles. I ordered what appeared proper for his situation, but with little or no benefit, until a copious eruption of about five hundred variolous pustules made their appearance. They went through the regular progress,

and did not begin to decay until the seventh day. He is about six years and a half old, and was vaccinated by me when about six months ; and, from my own recollection, as well as the mother's, the vesicle was large, much inflamed, several lancets were infected from it, and the cicatrix is now quite distinct. At the time he was affected, as above described, he was attending Newton school, where the small-pox were epidemic to a considerable extent, and no other disease prevalent of an exanthematous nature. His sister, now about three years old, was also vaccinated by me when four months ; in about eight days after the eruption made its appearance on her brother ; she fell sick, and continued so about two or three days, which was succeeded with a rash, but not followed with any eruption*.

* The same day she became sick, I had inoculated her from her brother, but in consequence of the occurrence of the fever, an efflorescence followed to a considerable extent, in less than twenty-four hours, and no pustule followed.

CASE XXVI.—JANUARY 1809.

Mary Paterson, in the village of Inveresk, was vaccinated by me when eight months old; is now three years. From my own recollection, the mother's description of the arm, lancets being infected, and a large cicatrix, there can be little doubt of her having undergone perfect vaccination. She sickened about the beginning of January, and, after remaining three days very distressed, a rash followed, attended with about a dozen of pustules, which, however, did not keep out above four days. In about three days after, a younger sister, about five months old, was affected, and, in a few days, was followed with an eruption to the extent of some hundreds; she was not vaccinated. The small-pox were prevalent in the neighbourhood, and no other exanthemata known at the time.

CASE XXVII.—FEBRUARY 1809.

Hearing that the child of one M'Donald, in the village of Inveresk, was labouring under the small-pox, after having been vaccinated, I called, and found her to have some hundred pustules. She is now upwards of five years, and was attending school where many children had gone away sick, and afterwards followed with the small-pox. They are now epidemic in the village. They matured as usual, and began to decay about the sixth day.

The child was vaccinated by Mr Graham of Dalkeith, when about a month old; from the father and mother's description, it would appear to have been a large vesicle, and very much inflamed, and has now left a very distinct, and extensive scar. Mr Graham saw it three or four times during the progress of the affection, and expressed himself well pleased with it.

CASES XXVIII, XXIX, AND XXX.

JANUARY 1809.

John Owen, in the parish of Newton, had two children vaccinated, when about six months old, the oldest by me, and the other by a Mr Armstrong, formerly surgeon to the Edinburgh militia. The oldest is now seven, and the other six years of age. To the best of my recollection, the vesicle was distinct, with a large areola, and I expressed myself, by the parents' account, perfectly satisfied. They give the same account of the other arm, and add, that it was fully more inflamed; both have now a distinct cicatrix. The eldest became sick in the beginning of January, which, in two or three days, was followed with about two hundred pustules, which began to decay about the fifth or sixth day. The other sickened in ten days after, and was followed with a very numerous eruption, at least

exceeding a thousand, the blains of which are still visible, and they did not decay until about the eighth day. They both attended the village school, and the small pox were prevalent, and fatal in the neighbourhood. They had also a younger child, now about four years, who was vaccinated by Mr Simons (then assistant surgeon of the same regiment) when about one year old. She also became sick a few days after the second, and, after continuing about two days, went off, without being followed with any eruption. Her arm has the same appearance with the other two, and in the parents' opinion, went exactly through the same course.

CASE XXXI.—JANUARY 1809.

James Jardin, in the parish of Newton, has had three children vaccinated by Mr Stevenson, surgeon in Gilmerton; the oldest is now seven, the second six, and

the youngest three years old. The two oldest were vaccinated when about eighteen months, and the youngest at twelve. The oldest sickened about the middle of January, which was followed by an eruption of about six hundred pustules, which did not begin to decay until the seventh day; the other two have not as yet complained. The mother says, that she distinctly remembers the appearance of the vesicle, and describes the areola to have exceeded a half-crown in circumference. Mr Stevenson also expressed himself well pleased with it at the time. The two oldest were attending school, and the small-pox were both prevalent and fatal all round.

CASES XXXII. AND XXXIII.

FEBRUARY 1809.

Alexander Cairns, in the parish of Inveresk, has had two children vaccinated;

the eldest of whom is now past seven, and was vaccinated with one puncture, by a practitioner of this place, when about two years old; the other is now six, and had the vaccine disease when about twelve months old; he was vaccinated in both arms by Mr Gibson, formerly of the Dumfries-shire militia. The parents say both their arms had the same appearance, having a vesicle, and a large circular inflammation; the crust fell off in about a fortnight after, and the scars are now equally distinct. They were both repeatedly visited during the progress of the disease, and both the gentlemen expressed themselves perfectly satisfied. On the 19th of February the oldest sickened, and, after being confined to bed two or three days, an eruption of several hundred distinct pustules took place; they were matured by the sixth or seventh day. This boy only attended school, and the small-pox were

prevalent all round. The other has not yet complained.

10th *March*.—I was requested to call, as the other had been sick for some days, and found an eruption had made its appearance, to the extent of two or three dozen, with a considerable rash upon the skin. In three or four days after, the pustules began to decay, and were nearly gone by the fifth or sixth day. A child about eighteen months old, who had never been vaccinated, fell sick at the same time, and had an eruption of distinct pustules, to the extent of some hundreds, and got safely through the disease.

CASES XXXIV, XXXV, AND XXXVI.

19th FEBRUARY 1809.

James Robertson, smith, in the village of Inveresk, had three children successively vaccinated by me, when a few months old. From my own recollection, and by the pa-

rents' report, the vesicles were distinct, and attended with large areolæ; the crusts fell off in twelve or fourteen days after the termination of the disease; and the scars on all of them are now equally distinct. The oldest is upwards of seven years, the second five, and the third three. The two oldest attended school, and sickened on the same day, which, after continuing two or three days, an eruption of some hundred pustules took place in the oldest, and in the other about two dozen. Those upon the oldest turned in about six days, and the other in about four or five. The small-pox were prevalent in the village, and one or two had died. The youngest has not yet complained. March 10th.—Was requested to call, and was informed the third and youngest became sick on the 6th, and, after continuing two or three days, was followed with an eruption of about two dozen of pustules, attended with a rash. They de-

cayed in a few days. She was not so sick as any of the other two, but started considerably, and was generally confined to bed.

CASE XXXVII.—DECEMBER 1808.

John King, in the parish of Newton, has had three children vaccinated. The oldest was done in both arms by Mr Simpson, surgeon in Dalkeith, when about three months. The other two, in one arm, by Mr Stevenson, about the same age. From the report of the parents, Mr Simpson was perfectly satisfied of the vesicles being perfect, and they also recollect that the appearance of the vesicles were large, and much inflamed. They afterwards formed into dark scabs, and have now left two scars. They give the same account of the other two, and knew no difference in the appearance betwixt any of their arms. The oldest is now seven years, the second past three, and the youngest past two. The

oldest sickened about the latter end of December, which, after continuing extremely severe, was followed with an eruption of about forty pustules. The pits of several are still visible. They began to decay about the sixth or seventh day. The small-pox was prevalent all round. He did not attend school, but played with those that had the small-pox, and went frequently into their houses. None of the others could be perceived to complain.

CASES XXXVIII. AND XXXIX.

FEBRUARY 1809.

James Galley, in the parish of Inveresk, has five children, the two oldest had the small-pox by inoculation, the next two were vaccinated, and the youngest had undergone neither. The two that were vaccinated, were under the care of two medical practitioners in this place, and from the report of the parents, had both the vesicle, and areola, and their arms have now a dis-

tinct cicatrix. The medical gentlemen expressed no other opinion, but that they had undergone the perfect form of the disease. They were vaccinated when about six months; the oldest is now six years, and the other past three. Upon the 21st of February, the oldest was evidently sick, and the eruption made its appearance to the extent of some hundreds in twenty-four hours after. She kept her bed during the whole progress of the disease, and the maturation was not completed until about the eighth day. The other sickened two days after, which was accompanied with a rash, and then followed with a dozen or two of pustules, which did not maturate, but decayed in about three or four days. In about ten days after, the remaining child, about twenty months old, became sick, and was followed with an eruption, to the extent of some hundreds, which went through the most common form of the disease.

The two children that had been inoculated had not the smallest complaint. The small-pox were prevalent in the neighbourhood, and the mother had often visited a child that died of the disease. The same medical gentlemen attended the whole, and from the parents' report, had no doubt of their being cases of small-pox.

CASES XL. AND XLI.—MARCH 1809.

James Caddel, mason, parish of Inveresk, has six children, four of whom still continue with him, the two oldest of which had the small-pox in the natural form, upwards of eight years ago; the oldest of the other two is four years and a half, and the youngest past two. The oldest was vaccinated by me, when four months old, in the arm, and the other by Mr Keith, surgeon of the Berwickshire militia, in both, about the same age. I recollect perfectly, that the vesicle and areola were quite cha-

racteristic ; and the mother describes, that the areola in both were equal to the size of half a crown, and that Mr Keith saw the arm in its progress, and expressed himself satisfied of the child having passed through the disease. The scars are very distinct. They both sickened about the 16th March, had considerable fever for three days, which was followed with an eruption of several dozens of pustules upon each, and, after an imperfect maturation, decayed in six days. The family of Cairns were in the immediate neighbourhood, and the small-pox prevailing all round. None of the other children complained in the smallest degree.

CASE XLII.—MARCH 1809.

James Drysdale, in the parish of Inveresk, has six children ; the four oldest had the small-pox from inoculation ; the fifth was vaccinated by me when six months old, and is now past five years ; the sixth is now about

two, and has neither been vaccinated nor inoculated. The one that was vaccinated sickened on Sunday the 12th, and continued until the Wednesday evening following, so extremely distressed, as to appear comatose, and the stomach rejected every thing. An eruption made its appearance on the Thursday morning, to the extent of at least five hundred, and did not begin to decay until the seventh day. He continued in bed two days after the appearance of the eruption. From my own recollection, and the mother's account, the inoculated vesicle was large and distinct, attended with considerable inflammation, and the cicatrix is now very large. The youngest has hitherto not complained, and none of the rest of the family have ailed in the smallest degree. The small-pox are epidemic all around.

April 3d.—I again called, and now found the child covered with a copious eruption of distinct small-pox, which had only made

their appearance the preceding day. She had been sick for three days, and was now considerably relieved; the eruption continued to mature until about the eighth day, and then began to decay. Still none of those complained who had passed through the small-pox.

CASE XLIII.—MARCH 1809.

James Deans, fisher, Prestonpans, has seven children in family; six had the small-pox from inoculation, and one was vaccinated by Mr Williamson, surgeon in Prestonpans, when one year old, and is now about five. It would appear from the arms that he had been vaccinated in two places in each arm, and, from the mother's report, all put on the appearance of pocks, attended with great inflammation, and Mr Williamson repeatedly infected lancets from them. He sickened about the seventh of March, and, after remaining for three days, extremely

distressed with the most severe fever, an eruption to the extent of some hundreds made its appearance, which continued to maturate until the seventh day, and then began to decay. When I first saw him, the crusts were nearly all fallen off, but both pits and blains were perfectly distinct. Mr W. had seen the child, but, from the mother's account, did not distinctly allow it to be small-pox. I saw him a second time, when the blains and other appearances were following the usual progress, and the parents, and the whole neighbourhood, expressed themselves perfectly satisfied of its having been, a most evident, and distinct case of small-pox. None of the rest of the family were in the smallest degree affected, and the small-pox had made their appearance in the neighbourhood.

CASES XLIV. AND XLV.—MARCH 1809.

James Hunter, fisher, Prestonpans, has three children; the oldest is six years, the second past four, and the third two. The two oldest, from the mother's account, were vaccinated at the same time, upwards of three years ago, by a Mr Nicol, assistant-surgeon in the Berwickshire militia, in both arms; and, from the mother's description, the vesicles were large, attended with great inflammation, and the scars in both arms are now distinct. The youngest of the two sickened on Sunday the 26th March, and, after remaining in bed two days, attended with vomiting, startings, and other symptoms of exanthemata, an eruption appeared to the extent of a hundred, which maturated in five days, and then rapidly decayed. The oldest fell sick on the Wednesday following, and at the time I saw the other, was confined to bed, and had been so for two

days. He was extremely sick, and affected with starting, sneezing, and other symptoms of eruptive fever. When I called, three days after, the sickness was gone, and no pustular eruption had followed. The youngest had not then complained. None of the children were at school, but two cases of small-pox were in their grandfather's, at a little distance, and they were prevalent in the village.

CASE XLVI.—APRIL 1809.

A Mr S. in the parish of Inveresk, has had three children successively vaccinated, by a practitioner in this place. The oldest is nine years, the second seven, and the youngest five. Both the parents state, that no objection whatever was started by the medical gentleman to any of the cases, that he was perfectly satisfied, and they declare that the arms of the whole went through the same course, having all a distinct pus-

tule, or vesicle, attended with a large areola, and the scars are now distinct. On Sunday, the 2d of April, the youngest became sick, which, after continuing with all the usual symptoms of variolous eruptive fever, for two days, was followed with an eruption to the extent of two or three hundred, which continued to mature until the fifth day, when they began to decay. She was five months old when vaccinated; was attending the common parish-school, and the small-pox in the immediate neighbourhood. The other two have not yet complained. The family consist of four more, who were all inoculated, and have not had the smallest complaint. The medical practitioner who vaccinated the child also saw her with the eruption, and, from the mother's account, allowed it to be small-pox.

CASE XLVII.—APRIL 1809.

Alexander Wilson, in the parish of Prestonpans, has two children; the oldest is now five years, and was vaccinated by Mr White, surgeon in Dysart, in one arm, when sixteen months old. From the mother's account, the arm had a large vesicle, and was accompanied with so much inflammation as to extend to the circumference of a half-crown; the cicatrix is now large and distinct. The other child had neither been vaccinated nor inoculated, and about the end of March became sick, and had a very copious eruption of small-pox. - Being next door, I called, and found the circumstances as already stated, and requested the mother might be attentive to inform me if the oldest should become sick. Accordingly, in ten days after, I was informed he had been complaining for two days, and some dozens of pustular points had made their appear-

ance. I called next day, and found the eruption distinct, but small, and they decayed in about four days; the small-pox were prevalent all round.

CASE XLVIII.—APRIL 1809.

Mr D. in the parish of Inveresk, has four children, the oldest of whom was inoculated, and the other three vaccinated. The oldest of the three is past ten, the second past eight, and the youngest five years of age. The two oldest were vaccinated by me at the same time, and the youngest by herself. The oldest and youngest are now at Dalkeith. On Saturday, the first April, the second, aged eight, appeared sick, and, after continuing extremely distressed for nearly three days, an eruption made its appearance to the extent of a thousand, or fifteen hundred, distinct pustules, and continued to maturate until the seventh or eighth day, and then decayed. She was vaccinated

when about four months old, in both arms, but only one succeeded; and, from my own recollection, and the mother's account, the arm proceeded through all its stages, and has now a distinct cicatrix. She attends a common school in the immediate neighbourhood, crowded with children; the small-pox have been prevalent in the village, and one or two have died almost next door. The one that was inoculated has not complained.

SECT. II.

Cases of Inoculation after Vaccination.

When I commenced the practice of vaccination, in common with most practitioners, I inoculated them a few weeks, or months after. This I continued to do, to the extent of thirty or forty cases, when finding the appearances nearly similar, I desisted. In these trials, the arm put on the following appearances: During the first three or four days, the punctured point was elevated, and a little inflamed, and had the same appearance as if no previous vaccination had existed; from the fourth to the sixth day, it still became more elevated and inflamed, but its progress less rapid than where no vaccination had taken place, and its point vesicated, but without any pustular

appearance ; from the sixth to the eighth, ninth, or tenth day, it acquired a pretty large conical figure, a good deal inflamed, but still without any pustular form ; after this period, it rapidly decayed, and in a few days disappeared, without leaving any scab or scar. In some cases it only gained the appearance as described, at the sixth day, and then decayed. In none of these trials were there ever the smallest appearance of a pustule, but frequently the point of the tumor presented the appearance of a small shining watery vesicle. In no case, were there the smallest shew of a circular inflammation, or areola, and no constitutional affection whatever.

After these trials, and the concurring testimony of other practitioners, and publications on the subject, I did not consider it necessary to persist any farther in these inoculations, and, from the year 1800, until last summer, I did not renew this practice.

CASES I. AND II.

Immediately, however, after the occurrence of the first four cases already inserted in this work, I thought it my duty to avail myself of every opportunity for renewing these inoculations; and accordingly, with virus taken from the girl there mentioned, I inoculated a boy and girl in one family, who had been both vaccinated by me when a few months old. They had been both punctured in two places on the same arm, and went through vaccination in the most perfect form; the areola being large, lancets were infected from them; and the mother thinks, to the best of her recollection, they gave symptoms of sickness, and the scars are now large. The boy is upwards of five, and the other four years of age. Both the inoculated arms advanced steadily, and, by the eighth day, assumed the appearance of a moderately elevated and inflamed tumor, with a pustule upon the point, but containing little virus: from the eighth to the eleventh day,

the inflammation rapidly extended in circumference, and the pustule much increased in diameter, but not containing much virus. It now, in every respect, resembled a variolous inoculation in a state of perfection, and, accordingly, was followed with constitutional symptoms. The boy became sick, and continued feverish for three days, with frequent starting, and at last an eruption of about a dozen or two of inflamed elevated points were observed—they only remained out three days, and then disappeared; there was a rash previous to the eruption. The girl's arm went through nearly the same course, but not to so great an extent; and, although sick, she had no rash nor eruption.

CASES III. AND IV.

With virus taken from the pustule on the boy's arm, I infected two children, one of whom had been vaccinated by Mr Benjamin Bell, and the other by myself, when a

few months old. The oldest was now near six, and the other about three; both the arms inflamed, and nearly arrived at the same appearance as already described in the other two cases; the pustules had less appearance of virus, and the circular inflammation not quite so extensive; but the pustule and circular inflammation was considerably more distinct, and extensive upon the oldest, than upon the arm of the youngest. They had a trifling degree of sickness for one day, and no eruption followed.

CASES V. AND VI.

No farther opportunity occurred until some months after, when, with virus taken from a natural pustule, I inoculated two boys, the one aged six, and the other eleven years. The youngest was vaccinated by me when a few months old, the other about two years ago when in Jamaica. The arm of the one, to my recollection, went through the regular progress, and the scar is now very distinct.

The other recollects perfectly of his arm having a large vesicle, and being very much inflamed; that a very great number were vaccinated from him; and that the practitioner assured his mother of his being secure against small-pox. The mother, however, on his being sent to this country, requested he might be inoculated, upon the small-pox being epidemic in his neighbourhood. Both the arms advanced nearly in the same manner until the sixth day, when the youngest assumed a more pustular appearance, with a broader base, and from the eighth to the tenth day, had an extensive circular inflammation. He, however, did not appear sick, and there was no eruption—a scab followed the pustule, and decayed as usual. The other, from the sixth day, advanced with a high conical appearance; the inflammation confined to the tumor itself; no distinct vesicle, and no areola whatever was produced; it however continued to increase until the tenth day, and then decayed. No

effect whatever was produced on the constitution, and it left no scab.

CASES VII. AND VIII.

At this period I had another opportunity of repeating this experiment. Two children of a Mr L——t had been both vaccinated by me when about three months old; the oldest was now three years, and the other nearly two. They were inoculated with the same virus, and on the same day. Their arms put on the same appearance until about the sixth day, when that of the oldest obtained a pustular point; and from that day, until the tenth, it gradually became more elevated and inflamed, until it gained the extent of a shilling; but the pustule was small, and contained little or no matter, and no constitutional effect could be detected; it decayed in a few days, and was followed by a small scab. The other never assumed any pustular appearance, but continued to gain a considerable elevation and extent, until

the ninth day, when it rapidly decayed ; it was attended with no febrile symptoms, and left no scab.

CASE IX.

In consequence of the frequent occurrence of small-pox succeeding to vaccination, I was requested to inoculate the child of a Mr H. who had been vaccinated by me when six months old, and is now six years. Both Mrs H. and I recollect distinctly, the appearance of the arm ; the vesicle was perfect, the areola very extensive, and the cicatrix is now large. On Monday the 13th March, I introduced, by one puncture, some very active virus, and on the Wednesday following, the punctured point was distinctly elevated and inflamed. I again examined it on Friday afternoon, and found it had now acquired a pustular point, and the inoculated tumor considerably inflamed, and much increased in size. Next day I found the pustule had been ruptured during the

course of the night, the tumor much enlarged, and surrounded with an erysipelatous inflammation, to the extent of a shilling. On Sunday the inflammation had extended considerably, and the point of the tumor had again acquired the appearance of an imperfect pustule, was discharging an ichthyous matter, and the child was now evidently sick and feverish. Next day the fever had increased so considerably, as to take away all appetite for food, and produced an inclination for keeping the bed. The arm was now extremely inflamed, accompanied with an areola to the extent of a penny-piece, and continued oozing out the same matter; a few inflamed points could also be seen making their appearance, a considerable distance from the inoculated spot. In two days after, the fever was quite gone, the inflammation much abated, and the pustules round the inoculated spot, to the number of a dozen, were proceeding to maturation.

CASE X.

Mr L. had two children vaccinated by Mr Stewart, Surgeon in Kelso, at five months old, one of whom is now six and the other four years of age. Mrs L. says she remembers the appearance of their arms perfectly ; that the vesicles were large, and accompanied with an extensive circular inflammation, exactly corresponding with what she has since observed in other two of her family. Mr Stewart was also perfectly satisfied, and the cicatrix is very distinct on both arms. On the same day with that of Mr H.'s child, I introduced the same small-pox virus by one puncture. On Wednesday the 15th, both punctures had evidently taken effect, and on the day following, the puncture on the arm of the oldest was sensibly increased in size, and beginning to assume a vesicular point, but on the arm of the youngest, the inoculated spot had sus-

tained some injury during the night, and appeared scabbed. On the 18th, the inoculated point upon the oldest was now much increased, and its extremity presented the appearance of a number of small vesicles, but giving no appearance of a distinct pustule; the inoculated spot upon the arm of the youngest seemed decaying, and attended with a crust. On Monday the inoculated spot was highly elevated, and inflamed, with a cluster of vesicles on its point, evidently containing virus, but still giving no appearance of a perfect pustule, and an areola was now beginning to form; the arm of the youngest was now nearly well. On the day following, a beautiful areola now extended itself to the circumference of a half-crown, and the vesicular point was large and distinct, and nearly formed a perfect pustule; the child now appeared unwell, her pulse was much quickened, the skin hot, her countenance pale, and wanted her usual

appetite and spirits ; she, however kept going about. These appearances continued for two or three days, when the areola began to decay, and a scab formed upon the point of the inoculated tumor.

CASE XII.

On Wednesday, the 22d of March, I inoculated the child of Mrs H. with limpid variolous virus, taken from a pustule of the epidemic disease. She is now seven years of age, and had been vaccinated by me at four months old. Both the mother and I recollect perfectly, that the vesicle was distinct, attended with a circular inflammation to a great extent, and the scar is now very large.

Upon calling, on the Saturday following, the punctured point was more advanced than common, was much elevated, and inflamed, and its point evidently vesicular. I again visited her on Tuesday, when the

vesicular point had become a small but distinct pustule, and the inflammation beginning to extend round it. On Thursday the 30th, I found her in bed, extremely sick, accompanied with much heat, headach, and thirst. Her mother informed me she had been very much affected from the Wednesday morning, and had frequent vomiting. Upon examining the arm, the pustule was still small, but contained virus (with which I infected a lancet), and was attended with a jagged areola of a deep red colour, extending to the circumference of a halfpenny. Upon examining the body, I perceived several pustular points, and a considerable redness. Saturday.—This was the first day she had been out of bed, from the first attack of sickness. Upon examining the arm, it had assumed a very distinct pustular appearance, and contained virus sufficient for infecting two, or three lancets, and the areola was an extremely deep, and bright red,

extending to the circumference of a penny-piece, irregular and jagged. The body was now covered all over with a measly rash, and a dozen and a half of distinct pustules could be counted upon the body. Tuesday.—The rash was now gone, the pustules perfectly distinct, and proceeding to maturation, and the arm in a state of decay.

CASE XII.

The child of a Mr M. in this place, had been vaccinated with one puncture in each arm, when about six months old, by a practitioner in this place, and the scars are now large and distinct. In consequence of the prevailing reports, she was inoculated by the same gentleman, with recent, and active small-pox virus, on the 4th of April, being then about six years old. I was permitted to see the arm, and, on the Saturday following, the inoculated spot had gained a

considerable size, was very red, and had a vesicated point, with the crust, from the puncture, on the centre. On Monday, the vesications had all nearly united, and formed a distinct pustular appearance, but neither so large, nor extensive, as takes place in cases of primary inoculation; it contained evidently a small quantity of transparent virus, and a small and faint areola could be distinguished. Tuesday.—The appearance of the pustule was much the same, but larger and more perfect, with the scab or crust in the centre, the areola considerably increased, and of a much brighter red. No constitutional symptoms could be detected; a slight heat appeared upon the skin, but little or no alteration in the pulse. Wednesday.—The pustule much the same; the areola as large as a penny-piece, irregular and jagged. From the report of Mrs M. and the maid, she had sneezed repeatedly, which they attributed to cold, and her appetite ap-

peared impaired. Upon counting the pulse, it was exactly 108, and, to my feelings, a slight heat appeared upon the skin. Thursday.—The areola of a deeper red, rather more extensive, and much jagged. The pustule appears somewhat decayed. She had sneezed some the preceding night, only drank tea to breakfast, but eat no bread. Her pulse exactly 98. Friday.—Both pustule and areola much decayed, her appetite still indifferent, and in other respects much the same as yesterday. Monday.—The areola quite gone, and the pustule scabbed.

SECT. III.

Cases of Small-Pox conjoined with Vaccination.

CASE I.

Although I have frequently met with instances, where small-pox occurred a few days after the introduction of the vaccine virus, yet I considered them as entitled to no more attention, than those cases, where the natural small-pox occurred, after inoculation. The following case, however, appears to me entitled to more attention, as it bears upon certain points contended for, both by the author of the practice, and other writers upon the subject.

— Wilson's child was vaccinated when about fourteen months old by a practitioner of this place. From the mother's ac-

count, the arm went on in the usual way, and, on the ninth day from vaccination, a most regular, and perfect vesicle, with a little circular inflammation, existed. Virus was at this time taken by the same gentleman from the arm. On the same day, however, the child was evidently sick, and on the next, a copious eruption made its appearance, which soon proved to be confluent small-pox. It was two, or three days after the eruption, that I had an opportunity of seeing the child, and the vesicle on the vaccinated arm was large, and much inflamed, and assumed every appearance of the perfect vaccine disease. The child died. The small-pox were epidemic in the neighbourhood.

CASE II.

I was requested to inoculate the child of a Mr D., and, on Sunday the 12th March, I introduced by puncture, variolous virus

into the right, and vaccine virus into the left arm. Each virus was limpid, the variolous was from the same source with that used in the cases of Mr H. and Mr L.'s children; the vaccine was taken from a vesicle on the eighth day. The Tuesday following, both punctures had evidently taken effect, and presented exactly the same appearance, when inspected with the assistance of a good glass; being red and elevated above the rest of the skin, and the structure of the skin rendered very distinct, by the inflamed point appearing like little vesicles or cells. On Thursday, both punctures were much enlarged, and presented the appearance of a distinct vesicle, or pustule, but small, and evidently cellular within. When again inspected on Saturday, the cow-pox vesicle was large, attended with a small circular inflammation, and seemed at least twenty-four hours farther advanced than the variolous pustule,

which, although much increased in size, and its circle jagged and unequal, had not the smallest circular inflammation. On Monday, the 20th, I found the child very sick, and was informed she had appeared unwell on the forenoon of the preceding day. The cow-pock arm was now beautifully characteristic, having a most perfect vesicle, and a complete double areola, extending about the size of a halfpenny; and exactly circular. The variolous pustule was now jagged, and irregular in two places, and attended with an erysipelatous inflammation, to the size of a small shilling. The depression in the centre of both was nearly the same, the cicatrix from the puncture quite evident, but in the vaccine vesicle most extensive. Upon visiting the child again, on Wednesday the 22d, the sickness was abated, and an eruption, to the extent of four or five dozen, had taken place. The cow-pox vesicle was now decaying; the areola,

although perfectly distinct, and of the same size, had faded considerably, and the crust had extended itself over one half of the vesicle. The small-pox pustule was still attended with inflammation, nearly to the same extent as when last described, and still but little decayed. At my next visit, two days after, the cow-pox vesicle was nearly completely scabbed, and, in the small-pox pustule, the crust had extended itself over half its circumference, and the circular inflammation almost gone. The pustules continued to increase, and, in general, arrived at maturation about the seventh day, and both vesicle, and pustule, scabbed in the usual form.

CASE III.—MARCH 1809.

Upon Monday the 18th March, the child of a Mr —— was inoculated with vaccine and variolous virus by puncture. The vaccine was introduced into the right, and the

small-pox into the left arm. Both pustule, and vesicle, followed the same course as described in the preceding case, and the vaccine vesicle again acquired the areola, full twenty-four hours, before the small-pox pustule. On the tenth day from inoculation, the vaccine areola was large, distinct, and circumscribed, and the variolous did not exceed a farthing. The child, however, had become sick the preceding day, and continued so about three days, which was followed with an eruption to the extent of some dozens. The small-pox pustule on the twelfth day, was considerably increased in size, and the areola, exceeded in circumference the size of a halfpenny. The cow-pox vesicle was now considerable decayed, the areola had become extremely faint, and both vesicle and pustule followed the same course as described in the foregoing case.

CASE IV.

On the first of April, I vaccinated and inoculated in the left arm, the child of a Mr ——. The punctures proceeded nearly in the same manner as has been described in the preceding cases, but with the difference, that the vaccinated vesicle seemed in its progress, evidently behind the inoculated pustule. On Saturday the eighth, the inoculation was evidently accompanied with a small areola, about the size of a sixpence, and the child appeared a little sick; no areola had yet begun to form round the vesicle. The day following, the child was very sick, the small-pox pustule irregular and extensive, with an areola at least, the size of a shilling. The vaccine vesicle had now acquired a small ring, and, in its other appearances, was perfectly characteristic. On Tuesday, the sickness was somewhat abated, and about a hundred pustules had

made their appearance over the body. The pustule was much the same, but somewhat decayed. The vesicle and areola, however, was beautifully characteristic, and joined the areola formed by the pustule. Thursday.—The small-pox and vaccine areola were much faded, the pustules proceeding to maturation, and the vaccine vesicle scabbing in the usual form.

CHAP. VII.

INQUIRY INTO THE PRECEDING CASES.

I HAVE already shewn, from an attentive consideration of the phenomena attending vaccination, and several other circumstances connected with that practice, that sufficient grounds are established, for calling in question every fact connected with its antivariolous powers. I trust, when, to what has been there stated, we shall add the proof arising from the preceding cases, we will have such an accumulation of evidence, that none but the most obstinate sceptic can possibly resist.

I.—*Are they to be considered as cases of
Small-pox ?*

To those who are acquainted with this subject, and are capable of appreciating proof of any kind, I apprehend we might safely trust to the perusal of the cases; but we shall take the liberty to remark, that in the evidence now before us, it is impossible to commit any mistake. It is perfectly clear, they could be neither *bug*, nor *flea* bites, or the *stings* of insects, as they were all uniformly preceded with fever, and followed with an eruption in many cases, arriving at the most distinct character of a small-pox pustule. They also, uniformly, extended themselves, only through that part of the family that had undergone vaccination; whereas, had they proceeded from any of those causes, they would have affected the whole. They were also evidently propa-

gated by contagion, and small-pox were universally prevailing as an epidemic. It is hardly necessary to remark, that none of these peculiarities apply to those causes already mentioned ; and if fever at any time is known to follow the stings, or bites, of more powerful insects, there are sufficient evidence of its nature, from the previous existence of the cause, and they have never yet been found capable of producing any pustular eruption.

With regard to confounding them with chicken-pox, I apprehend that no practitioner of moderate experience, can possibly, at any time, commit the mistake. The chicken-pox vesicle, at all times, differs in so striking a manner from the small-pox pustule, that with the least attention, they may be readily distinguished. In less than twenty-four hours from the first appearance of the eruption, they acquire the appearance of a vesicle, having a perfect resemblance to

any blister produced by scalding, or cantharides, and in about twenty-four hours more, either burst or rapidly mature, and present, in their decay, the appearance of a small pointed scab, attended with a diffused redness, and slight turgescence, of the surrounding parts; nor even, upon their first appearance, are they attended with the elevation of the surface, which attends the small-pox pustule; do not give the same hard feel under the finger; and are uniformly destitute of the depression in the centre. * But here

* Dr Heberden describes the varicella or chicken-pox nearly in the following terms: "The inflammation round the chicken-pox is very small, and the contents of them do not seem to be owing to suppuration, as in the small-pox; but rather to what is extravasated immediately under the cuticle, as in a common blister. It happens to most of them, either on the first day that the little vesicle arises, or on the day after, that its tender cuticle is burst; a thin scab is then formed on the top of the pock, and the swelling abates without its ever being turned into pus, as in small-pox."

Dr Willan remarks: "That variolous pustules are, on the first and second day, small, hard, globular, red and painful, and indented in the centre; the varicella exhibits, on the first

we are not left to depend entirely upon the difference in the eruption, we have, over and above, the most decisive testimony; small-pox were epidemic in every direction, and even existed under the same roof, with the most characteristic phenomena; none of the children in the family affected but those who had been vaccinated, and neither chicken-pox, nor any other eruptive disease, were known in the whole neighbourhood. If they cannot then be any of those affections, I apprehend it is impossible that they can be confounded with any other. It is evident that they all carry along with them, either in the fever, the eruption, or other

day of eruption, small red protuberances, not exactly circular, and having a flat shining surface, in the centre of which is a vesicle, of a greater or smaller size, which about the third day is either ruptured, or shrivelled, and if attended with much inflammation, and remain entire, seem to contain a little purulent matter, and by the fourth, have obtained a small pointed dark scab. These appearances fully characterize varicella, and distinguish it from the firm and durable eruption of small-pox."

concomitant circumstances, the most undoubted evidence of small-pox, and none but the most unreasonable, and perverse vacci-
nist, can possibly deny, but that the evidence, in this respect, is most conclusive.

II.—*That they are to be considered as Cases of constitutional Vaccination.*

In order to have a clear view of this subject, it seems absolutely necessary to come to some understanding concerning constitutional vaccination; and the first question that naturally occurs, is, Are there no circumstances by which, constitutional vaccination can be ascertained to have taken place?

We have already seen, according to the warmest abettors of the practice, that none of the phenomena of the disease are to be depended upon, and that even they contend the tests of inoculation, and exposure to the epidemic, are not decisive of the constitu-

tional effect having been imparted. We have also seen, that if these tests are not sufficient, that which Mr Bryce proposes is not entitled to more attention. We may here, indeed, exclaim, What is to be done to extricate ourselves from such a tissue of absurdity, and contradiction? The way, I apprehend, is, nevertheless, neither difficult, nor dubious; we have only to return to the commencement of the practice, attend strictly to the phenomena of the disease, and indulge in neither speculation nor conjecture.

If, upon the introduction of vaccine virus, a vesicle is produced, attended with more or less of an areola, or circular inflammation, continued for two or three days, with, or without symptoms of constitutional derangement, we may conclude, that the vaccine virus has exerted every effect upon the constitution it is capable of, and if the vesicle remains whole, and afterwards forms a dark-coloured scab, or crust, which in two

or three weeks drops off and leaves a scar, we may consider the disease as having run its natural course. If the person is now made to undergo the tests of inoculation, and exposure to the epidemic small-pox, he will be found to resist them both.

It also appears from experience, and the authority of all who have wrote upon the subject, that although the vesicle should vary considerably in size, colour and figure; the erysipelatous inflammation be of greater, or lesser extent; sometimes circular, and sometimes jagged and irregular, either with, or without constitutional derangement; and whether or not, a dark-coloured scab is formed, falling off at certain period, and leaving a small or large scar, yet still the *same* effect is found to be the consequence, and the most *perfect* resistance given to every test. To say that all this is not enough, that this may be all obtained, and still the vaccine influence not constitutional-

ly exerted, is a solecism beyond all comprehension. It surely cannot be seriously urged, that these effects may be obtained, without the vaccine vesicle exerting any influence; that the constitutional effect is exerted in the *one* case, and *local* in the other, although an *equal* resistance is made to the *same* species of proof; that if the same results are found to follow from one cause, that the one is *complete* and the other *incomplete*; or that if any difference, or variety in the phenomena, should really constitute a different disease, that still the *effect should be the same*.

Here again, we may inquire, to what length are their suppositions, and our indulgence to be carried? We must remark, that this *string* of evasions was only brought forward after the occurrence of many cases, inimical to the perfection of the discovery, and are therefore entitled to but little credit. Indeed the vaccinists themselves differ wide-

ly in explaining this point; Dr Willan and others, being inclined to admit, that a *partial* security may be really obtained from vaccination, exerting an *incomplete* influence over the system, while Mr Bryce contends, that if it exerts any, it *must be complete*. These *violent* contradictions we shall leave to themselves to reconcile, and shall observe, that as there is nothing more certain in the whole practice of vaccination, than if you obtain a vesicle, attended with an erysipelatous inflammation, or areola, whether retaining, more or less distinctly, the characteristics of the disease, you will *uniformly* produce a security against the tests already mentioned. It is, therefore, impossible to grant, that such tests can be resisted without vaccination having exerted its constitutional effect, and that if such tests are deemed sufficient proof in *some cases*, they must be considered equally so in the *whole*.

Mr Bryce's singular excuse in order to defeat this conclusion, is evidently not well founded, and cannot be admitted. He says, that there are many constitutions that may be insensible to the influence of cow-pox, although the characteristic vesicle, and phenomena are all present, and that such constitutions are still liable to the influence of small-pox, but in so mild a way, as to produce an eruption of inflamed papular points, which speedily decay; thereby meaning to convey, that all those cases where such eruptions have taken place, after vaccination, were merely mild cases of small-pox, and not rendered so, by the constitutional influence of vaccination, which he contends, had never in those cases been exerted.

This defence, however, I apprehend it will not be difficult to overturn; for it is unequivocally admitted by Dr Willan, and even by the College of Physicians in Lon-

don, that such cases have really occurred after vaccination; and I apprehend, also, that the preceding evidence affords the most decisive testimony of the fact. But independent of these considerations, the observation is quite opposite to all experience. It is well known, that either in the natural or inoculated small-pox, the complete pustular appearance of the eruption does not always take place, and this seems uniformly to depend upon the mildness of the symptoms, and extent of the eruption; but here the resemblance ceases: for, in the first place, these cases are extremely rare; and in the next, whenever the eruption exceeds a dozen or two, they almost uniformly suppurate, and go through the characteristic appearance of small-pox. Besides, when the disease is communicated by infection, such a consequence seldom occurs; for in the instances before us, where the disease was communicated either from a source,

which had never gone through vaccination, or otherwise, still, in almost every case, the results was nearly the same, and the pustules in many cases, although exceeding a hundred or two, seldom went through the regular progress. But to all these reasons is to be added, that all the cases hitherto brought forward, uniformly possess the same character; from which it distinctly follows, that they are rendered so from some cause, and I think there can be little doubt but this cause must be vaccination. It must therefore either be allowed, that it is capable of exerting a partial constitutional influence in *many* cases, or that it does so in *all*.

Although we have thus seen that the uniformity of the phenomena, and the resisting the tests of inoculation, and exposure to variolous contagion, afford the strongest grounds for concluding, that vaccination may be considered as having exerted its full powers upon the constitution, still, how-

ever, the advocates of the practice contend, that the phenomena are so *nice* of distinction, that none but the most *experienced*, can undertake to vaccinate with precision.

This too might be more readily granted, if these gentlemen would be so good as condescend to notice, what really are the appearances to be depended upon. But when we find that all of them admit, that every one of the phenomena may readily undergo every possible variation, that not *one* circumstance can be pointed out, as capable of characterizing its existence, and that all the variety of appearances, and other *cross* and *untoward* accidents, attend the practice, even when in the *hands* of Dr Jenner or others, who contend for *superior* information, whether derived from more extensive practice, or more accurate observation; it is impossible to find out upon what grounds they can *insist*, that experience has any advantage.

Waving this entirely, and leaving it to the vaccinists to determine, I apprehend we may derive some assistance from our experience in the practice of inoculation. The difference betwixt the practice of vaccination, and inoculation, is by no means so great as to throw away as useless, all that information which our former experience certainly imparted. I contend, that the phenomena, so far as they depend upon the vesicle, and pustule, enabling us to judge of their producing the constitutional effect, are exactly the same. It was well known to those who had any experience in the practice of inoculation, that every variation of the pustule and areola, were still capable of producing the constitutional influence. You might have every variety already noticed, as occurring in vaccination, and still the constitutional disease imparted in its greatest perfection. The areola was here looked upon as the decisive test of its influ-

encing the system, and as a proof of the perfect satisfaction that existed, no body ever *dreamed* of re-inoculation where the pustule and areola were obtained. The experience, therefore, that any practitioner formerly obtained under the practice of inoculation, is by no means to be laid aside as useless, in conducting that of vaccination, or enabling him to judge of its merits; on the contrary, I am seriously inclined to maintain, that if any practitioner has not had that experience, he is incompetent either to conduct, or judge of vaccination, singly, or comparatively.

In conformity then, both with my own experience of the phenomena of inoculation, and vaccination, I contend, that if you have a vesicle, attended with an areola, you may depend upon the production of whatever effects it is capable of; and that the erysipelatous inflammation round the vesicle, forms the principle criterion of its con-

stitutional effect, is farther confirmed, even by Mr Bryce's test of double vaccination; for surely it cannot be alleged, that it is more decisive of constitutional influence in the secondary vesicle, than in the primary one; and we have elsewhere shown, that this test is entitled to no more attention than the areola in the first instance, as it never occurs unless the other has previously existed, and therefore the first must be fully as satisfactory, as if the double vaccination had not been employed*.

* Dr Willan ranks a vesicle without an areola, as an irregular appearance, and which will be found not to secure the constitution against small-pox.

Dr Jenner also says, in a letter to Dr Willan, dated only in February 1806, "The absence of the areola is so rare an occurrence, that I can say nothing decisive upon it. Out of the last 3000 punctures (vaccinations) I have not noticed its being wanting, except in one instance."

But we must also, here, particularly remark, that if the vesicle could be detected as small, or deviating from its common form, and the areola of a particular colour, figure, or trifling extent, in those cases where small-pox succeeded to vaccination, then the cases were pronounced to have been instances of imperfect or local vaccination. We must therefore conclude, that where the vesicle and areola were characteristic, the disease had been constitutionally imparted.

But that the areola is to be considered as an *unequivocal* test, is proved by the curious fact, which inoculators, and vaccinators of any experience are well acquainted with; I mean those cases, where, soon after the introduction of the virus, an extensive inflammation follows; or where, if any accident happens to the inoculated tumor, previous to the formation of a perfect pustule, and an areola still succeeds, and constitutional symptoms make their appearance; upon reinoculation, or revaccination, with the best attention, we can make nothing of it.

This naturally leads me to a subject, which is too extensive to discuss here, but which, I think, would not be a very difficult task to prove. What I allude to is, that the constitutional symptoms, in cases of inoculation, do not depend upon the absorption of the virus producing its effects upon the system, by exercising its

influence through the medium of the circulation. I shall only here observe, that no feverish symptoms, no swelled glands, no startings, are found to follow the most extensive ulcerations, unless attended with symptoms of topical irritation, and inflammation. Farther, that all those effects follow from local irritation, without any pustule or vesicle whatever; and in the production of small-pox, measles, chicken-pox, scarlatina, or cynanche maligna, we have all the cuticular phenomena of these diseases, and absorption is far from being considered as the certain medium, by which either these, or any other contagion, finds its way to exert its effects on the system. I conceive, too, the old doctrines of fermentation, and assimilation, to be nearly exploded, and, at all events, to be wholly inadequate to the satisfactory explanation of the phenomena.

The true explanation appears to me to

be, that upon the introduction of the virus, it gradually exerts its topical effects, until it produces a pustule, or vesicle, *sui generis*; that this vesicle, after arriving at a certain length, begins to exert its specific local effect; and that this is communicated to the constitution, through the medium of the nervous system, which, when it occurs, is immediately accompanied with an areola. Whether this be the true explanation or not, it readily affords a clue to many of the phenomena which attend both vaccination and inoculation, and which, upon the principle of absorption, cannot be accounted for in a satisfactory manner.

Having thus endeavoured to ascertain, that the phenomena of vaccination itself, afford the best *data* for determining its constitutional existence, we must now observe, that the proof afforded by the description of these cases is most complete, and satisfactory. Those who were vacci-

nated by myself, I can take upon me to say, had all the vesicle, and areola, in their most proper form, although subject to the variety I have already noticed ; and, to the best of my recollection, I never allowed any case to pass, without repeated vaccination, where the areola did not please me, or, in other words, was not extensive.

Those who were vaccinated by the other practitioners, indeed, depend chiefly upon the report of the parents ; but I am not aware, that any solid objection can be made to their evidence *, more especially, when it is considered, that they can have no proper motive for deception ; that they may be all competent judges of the existence of a vesicle, or pock, and whether or not it was accompanied, with a circular inflammation ; more especially too, when many of

* The vaccinists, it must be observed, admit the evidence of the parents, when it accounts for the failures of vaccination.

them had several children successively vaccinated; but when these circumstances are corroborated by the account given of the opinion, and declaration of the medical gentlemen, the existence of a large and distinct cicatrix being still evident*, the great variety of practitioners who conducted the operation, and, above all, the number of cases, and the uniformity in their results, little doubt can remain of their having undergone that form of vaccination, which is capable of imparting, whatever antivariolous powers it is possessed of. But it may be farther observed, that of the cases where small-pox recurred, many were in one family, and had been vaccinated both by the same, or by different practitioners at different periods;

* The appearance of the cicatrix is uniformly made an important circumstance by the vaccinists, in ascertaining the extent of vaccination, and wherever small-pox have occurred, and the cicatrix small, the case is uniformly pronounced imperfect. We must therefore insist that the proof is *vice versa*.

it would therefore be surely quite unreasonable to conclude, that they had been all only *locally* vaccinated ; and if this is not possible, it then follows, from the uniformity of the effects produced, that they must be all considered as cases of *constitutional* vaccination ; for we have already endeavoured to shew, that it is impossible to explain the appearances which occur in the history of these cases, by supposing, according to Mr Bryce, that they may have been *all* instances of a *mild* small-pox, without being influenced from the effects of vaccination.

III.—*That these cases afford the most convincing proof, of the antivariolous power of Vaccination, being at best, temporary.*

We shall now proceed to examine, how far the proof here adduced can affect the antivariolous efficacy of vaccination ; and, for this purpose, I apprehend it is quite un-

necessary to enter into a minute, and detailed examination of the cases ; it will not only save time, and trouble, but will also place them in a more distinct, and decisive point of view, to arrange the inferences they afford, under distinct heads ; and I trust they will be found to warrant the following conclusions :

1. That they afford grounds for concluding, that the antivariolous influence, directly after vaccination, is to be considered as *nearly* perfect.

2. That in proportion to the distance from the period of vaccination, the antivariolous power is *proportionally* diminished.

3. That about three years after vaccination, the constitutional influence is so much diminished, as readily to allow the operation of the variolous contagion, but still exerting a considerable effect, in *mitigating* the disease.

4. That at the distance of five or six years from vaccination, the facility is so much increased, as hardly to impart *any* security, and so much diminished in its powers of *mitigating* the disease, that, at this period, the cases very nearly approach, to the most common form of the distinct disease.

5. That the eruptive fever, and all the other peculiarities of small-pox, increase in severity, and assume the characteristic phenomena, according to the foregoing rule, so as to *approach* to the natural disease.

6. That the period of security, as well as the severity of symptoms, are evidently influenced by the *manner* in which the contagion is applied.

7. That the powers of variolous contagion are evidently increased by the accumulation of individuals, although not attended with small-pox eruptions, and also, in proportion to the number of cases, and extent of eruption.

8. They show, in the most *irresistible* manner, that small-pox, either from the natural disease, or from inoculation, are not so liable to recur, or, are not so imperfect a protection against their own future poison, as that which is produced by vaccination, as there was not *one* instance, where a single individual was in the smallest degree, *again* affected.

9. They afford grounds for concluding, that cases where the constitution resists the small-pox, although neither inoculated, nor vaccinated, are either not so very uncommon, or that they must have previously passed through the disease, in such a slight way, as not to be perceptible.

10. They show there is *really* no difficulty, or *great* delicacy in conducting vaccination; for those instances that were vaccinated by the *mother*, and a *farrier*, were shown to be equally constitutional from their ef-

fects, with those conducted by the whole of the medical practitioners*.

11. They show distinctly, that the *pretence* of the disease of vaccination, being so little understood at its commencement, is wholly destitute of foundation, and cannot be admitted as an excuse for the occurrence of small-pox.

12. They prove distinctly, that, by increasing the number of vesicles, you give no additional security to your patient; and that, although you may thereby increase the appearance of constitutional symptoms, you do not render the antivariolous influence of vaccination *more* complete.

13. That the cases of re-inoculation, exactly correspond in their effects with the influence of the epidemic disease, always making a nearer approach, both to the external

* It is gravely stated by the vaccinists, that a lady in Monmouth has vaccinated 1600, none of which have ever taken the small-pox. *She was taught by Dr Jenner.*

characters of an inoculated pustule, and to the constitutional affection, exactly in proportion to the distance they are removed from vaccination.

14. They also distinctly show, that there is a material difference betwixt the powers of the small-pox contagion, exerted in its epidemic form, and when imparted by inoculation.

15. These cases, and the whole phenomena and circumstances of vaccination, shew, that there are just grounds for concluding, that a specific action may exist, *minus*, or *negatively*, in the constitution; that therefore it would be improper, in the event of vaccination being found inadequate to maintain its antivariolous character, to re-inoculate those cases which have previously undergone vaccination, before it was capable of producing a distinct constitutional effect.

Lastly. That they afford strong grounds for concluding, that this distinct constitutional influence cannot be depended upon to take place, sooner than about six years from vaccination.

To these general conclusions, I have to add, that, in many of the cases, the fever, and symptoms of exanthemata, were so severe, as to occasion the greatest apprehension of convulsions, or an affection of the brain, and in one instance, a fit actually did occur. This was easily accounted for, from its age; and the absence of convulsions, in all the other cases, is to be attributed entirely to their being older, where even in the natural small-pox, they are a very rare occurrence. This case, too, is the only one where the antivariolous influence only extended to a few months; and the reason of this, as well as her sister not complaining, seemed to me to be owing to being the knee-child, and was carried about by the

mother, in her visits to her several neighbours, who had all their families affected, and in one house alone, I was informed three children had died.

It is well worthy of particular observation, that amongst all those instances I have met with, and I believe, also, nearly all the instances that have hitherto been brought forward, very few cases have occurred where small-pox succeeded to vaccination in the higher, and respectable classes of society. The explanation is obvious; all the higher ranks of society uniformly availed themselves either of inoculation, or vaccination; and as they all in general now attend schools, where the whole are on a footing in that respect, and even in their amusements are still amongst themselves, it is impossible that contagion should reach them so readily, either in public or private; but wherever, from necessity, they were placed in different circumstances, then we

find the same result uniformly followed. We may here by the way remark, that this fact also very strongly, nay, indeed, I may say incontestibly proves, that the others are to be considered as having been perfectly vaccinated ; for it certainly would be nearly madness to contend, that such uniform exemption, can be owing to the process having been properly conducted in the one class, and imperfectly in the other.

This circumstance, too, readily explains, why many practitioners have not met with any cases where small-pox have succeeded vaccination ; as it is well known, that those gentlemen who are at the head of their profession, and in large cities, have very little connection with the lower classes of society ; and this, together with the fact, that these people never think of calling in any medical assistance, even in the most severe cases of small-pox, will easily account for the few cases, that have come to

the knowledge, of even the *hospital* vaccinators; for unless their other practice led them to the spot, where such cases existed, they would never be heard of. Indeed, it may be here observed, from Mr Bryce's own account, that the hospital practice of vaccination is liable to many objections. The vaccinators are in general, entirely at the mercy, and discretion of the lowest class of paupers; they very frequently never set eyes upon the patient after the mere introduction of the virus, and are seldom afforded more than *two*, or *three* opportunities of seeing the arm. Besides, all farther connection and correspondence is at an end upon the completion of the process; they have no farther access to hear of the future security afforded by the practice; and although those gentlemen appear to have vaccinated *thousands*, for the *hundreds* of other practitioners, still they do not afford reasons in the same proportion, for

concluding, that their practice, or opinions, are entitled to more weight, and attention.

Before concluding this part of our subject, we must not omit stating, what appears to me a very important, and decisive fact. In the village of East Duddingston, in the month of July last, there were exactly twenty-one children who had undergone vaccination, seven of whom, it appears, from the history of the cases, were influenced by the variolous contagion; of the fourteen that remained free from any complaint, nine had been vaccinated by Mr Gillespie only two or three months before, and of the other five, one was five years old, and had been vaccinated at six months; another three years old, who had been vaccinated at four months; a third two years, and vaccinated at four months old; a fourth three years, and vaccinated at six months, and the fifth two years, and vaccinated at five months.

CHAP. VIII.

EXAMINATION HOW FAR THE TESTS, AND SOME OTHER OBJECTIONS, CAN OBVIATE THOSE CASES, WHERE SMALL-POX HAVE RECURRED AFTER VACCINATION.

WE shall now proceed to examine those remaining objections, which the vaccinists contend, are sufficient to counterbalance, and overturn every opposition.

I.—*The Tests of Inoculation and Exposure to the Epidemic.*

It is contended, in the first place, that the tests of resisting inoculation, and exposure to the variolous contagion, are so uni-

form, and so numerous, that they afford the most decisive testimony of the complete antivariolous power of vaccination.

We may however observe, that as nearly, if not entirely, the whole of the instances where these tests were had recourse to, were only applied a few weeks, or months, after the period of vaccination, neither their uniformity, nor number, can be allowed their full operation in removing every objection, because it is not contended, that vaccination is destitute of all antivariolous power; on the contrary, it is expressly stated, that it certainly does confer such immunity to a certain extent, but that it gradually diminishes, and wears out of the constitution. I apprehend it will clearly appear, that when the test of inoculation is either renewed, or deferred for some years, a very contrary appearance takes place, and therefore a very opposite conclusion must be drawn.

I have elsewhere observed, that if you inoculate a person who has either undergone small-pox by contagion, or intentionally, at any distance of time from his having passed through the disease, you will not, *once* in a thousand instances, obtain any thing more than an inflamed, and somewhat elevated point, without the smallest appearance of a pustule, generally beginning to decay by the fourth or fifth day, seldom or never longer than the sixth, and never followed with a scab. On the contrary, if you inoculate a person who has undergone vaccination only a few weeks before, you will almost uniformly obtain a large, highly elevated, and inflamed tumor, having a vesicular point, sometimes distinctly approaching, if not to a pustule, at least to a vesicle, but with *no areola*, which, after continuing for nine, or ten days, will gradually decay, seldom leaving a scab, and never followed, or attended with any constitutional derange-

ment. If, however, you either repeat this on the same person, at the distance of a few years, or if you defer inoculation until from two, to five, or six years, after vaccination, you will uniformly find a considerable difference produced in the phenomena; the punctured point will now be found going more or less through the regular progress of the small-pox inoculation; in general attended with a small pustule, sometimes containing virus, and sometimes with little, or none, and a circular inflammation, sometimes with, and sometimes without constitutional symptoms, not unfrequently with a rash, and sometimes with pustules, or inflamed points.

From the cases contained in this volume, and others to the same effect, which I have not inserted, I have not the smallest apprehension, that this statement can be contradicted by any one, who has had sufficient experience of this nature. Indeed, I have

little hesitation in referring the decision of the whole question to this fact, which is almost within the power of every practitioner to obtain, when I trust it will be distinctly found, that in proportion to the extent of the period from vaccination, so will the approach be nearer to the appearance, and effects of perfect inoculation *. But it is also to be observed, that such consequences and appearances are *now* acknowledged, both by Dr Jenner, and many other writers on the subject, who at first would not admit of, or,

* In conducting inoculation with variolous virus after vaccination, it would appear, in general, practitioners have been so anxious to communicate the disease, that they introduced the virus in a more severe manner, and in a greater number of places than where it is performed, where no previous vaccination has taken place. This method is not only unnecessary, but prejudicial to the regular progress of the punctured point, and will very frequently end in the disappointment of all concerned. But if the matter is merely introduced by one slight puncture, not much exceeding two-tenths of an inch in depth, and at the same time giving the lancet a horizontal direction under the cuticle, it will not only be more certain of proceeding through its regular local progress, but also of producing its constitutional effect.

at all events, described the appearances upon reinoculation, in a very different manner. Mr Bryce, however, seems to consider it as a triumphant test of the superior powers of vaccination, that the cases which have come to his knowledge, were followed with, neither eruption, nor other severe symptoms. But here it is to be remarked, that not only the cases contained in this work, but also many others related by different practitioners, expressly contradict this assertion, and distinctly shew, that all the symptoms of the most perfect small-pox can be obtained*. But even were it the case, that no such consequences could

* The cases contained in the Medical and Physical Journal for August 1801 clearly prove, that fever and pustules may be produced by variolous inoculation, only six months after vaccination.

In Dr Willan's account of cases, we also find, that out of eight persons inoculated with vaccine virus at different periods, Mr Goldson states, that four had distinct variolous eruptions from inoculation, and four by casual infection. Mr Dunning of Plymouth has also given several cases to the same purpose.

yet be produced, still it would not afford any great reason to attach greater faith to the practice, because we know perfectly, that inoculation was only recommended, and practised, from its possessing the power of abating every symptom of the disease occurring as an epidemic, and, in many instances, rendering them so mild, as hardly to resemble the parent disease: therefore, if vaccination has any antivariolous power whatever, it should certainly be particularly evident, when the small-pox virus is applied in the way of inoculation. We may observe still farther, that it has been too readily allowed, that pustules being produced at the inoculated part, afford no ground for concluding, that the constitutional influence of vaccination has abated. This, I am by no means prepared to grant, because, neither in inoculation after small-pox, nor even for some time after vaccination, or in revaccination itself within

a certain period, we cannot produce the smallest approach to a pustule or vesicle. Something more is evidently implied in the formation of the pustule ; and it must, I think, be concluded, from its being so *readily* obtained in the one case, and *never* in the other, a distinct proof is afforded, that, from the distance of the period of vaccination, some change has taken place in the constitution, more favourable to the production of small-pox.

If, from these facts and reasons, we are at liberty to conclude, that the test of inoculation by no means proves the complete antivariolous powers of vaccination, I apprehend that of exposure to the epidemic, is entitled to much less influence and attention. We must insist, that the cases before us are to be considered as the most decisive evidence, that, in point of fact, small-pox does occur after vaccination ; therefore, although like the test of inoculation, the

epidemic contagion was resisted directly, or for some time after vaccination, yet still after some interval, it readily reassumes its influence, so that, by the sixth year from vaccination, to produce all its characteristic phenomena to a *distressing*, and even *alarming* extent. Fortunately, however, this conclusion does not rest upon the evidence which I have produced; a prodigious number of cases have been stated, both by vaccinists and antivaccinists, which put the question beyond all contradiction; and when we examine the whole which have hitherto been brought forward, we find they are so uniform in their features, and so exactly correspond in all material points, that it is impossible to refuse our assent, that these circumstances cannot be the effect of accident, but must be produced by the partial, and temporary influence of vaccination. That this is really the fact, is also strikingly corroborated, when we compare the ap-

pearances which we have seen take place from reinoculation, with the phenomena produced by the application of variolous contagion ; for we uniformly find, that they bear an exact proportion to their effects upon the system, where it has not previously undergone the variolous disease ; the epidemic contagion always producing a more severe disease, than what takes place from introducing the variolous virus, by inoculation. But farther, the uniformity of the extent of their influence upon the system, so exactly corresponds with the distance from vaccination, that a very decisive proof is afforded, not only that vaccination had exerted its effects upon the system, but that it was actually daily diminishing.

The assertion, that although Dr Jenner, and his nephew, have vaccinated upwards of five thousand, not one instance has occurred which has been succeeded by small-pox, is, in my opinion, entitled to but

little weight in determining this question. Before this can have any influence, the Doctor, and his relation must shew, that in point of fact, there exist such circumstances in conducting vaccination, that few, or none but himself, and his relation, can be a judge of, and sufficient grounds made out, for a complete change in the whole circumstances of the affection, so as to cancel the effect of all those cases, principles, and instructions which were first given by himself on the subject. It is impossible, too, to attach implicit credit to these assertions; for, independent of both the Doctor and his nephew being *principals* in the cause, and fully committed to the public for the advantages of their discovery, the description first given by the Doctor, of the appearances that took place upon reinoculation, were wholly incorrect, and is even now, contradicted by himself. But farther, such an assertion is not to be credited, when it is considered,

that it comes from a quarter, that has not hesitated to say, that all the cases hitherto brought forward, must be either *chicken-pox* or *bug-bites* *. In these observations, we do not mean to charge the Doctor with wilful misrepresentation; on the contrary, we are ready to allow him the greatest merit for his diligence, and even accuracy, in his researches upon this business, and that no individual perhaps could have resisted, or indeed, would have been warranted in resisting, such evidence as the subject admitted of; but certainly we do mean to assert, that these circumstances clearly point out, a strong prejudice, and partiality, in favour of his discovery, and a blindness, and enmity to every fact, which can militate against it.

* An assertion to which the testimony of the College of Physicians in London, Dr Willan, Dr Adams, and many other respectable authorities, are in direct opposition.

II.—*Analogy.*

The advocates of vaccination also contend, that analogy affords no encouragement to the opinion of the temporary influence of vaccination, but positively supports the idea, that after such an impression is made upon the system, it will neither diminish, nor wear out.

I apprehend, however, on the contrary, there are the strongest grounds for concluding, that analogy not only gives no countenance to such an opinion, but expressly supports the idea of a temporary and partial influence, and, at all events, can afford but little refuge from the present pressure of facts, although the Royal College of Physicians in London have given it their sanction.

We must first observe, that certainly the Royal College forgot, they had previously admitted, without any reserve, that nothing analogous existed in nature ; we, therefore,

cannot exactly see the propriety of extending the benefits of this general rule, to the phenomena of that practice. We might, perhaps, be able readily to understand, how vaccination, if a specific disease, might recur only once in our lives, like many of the class of exanthemata ; but how we are to allow, or to draw a conclusive proof from this circumstance, that the existence of one disease, is capable of preventing another, however opposite, is what we have no evidence of. We see that measles, small-pox, chicken-pox, and hooping-cough, readily prevent the recurrence of themselves ; but we do not find that they prevent each other ; and, therefore, unless it could be shewn, that the cow-pox, and small-pox are one and the same disease, no such power can possibly be granted. But farther, it is to be observed, that all those diseases which the constitution is positively exempted from a repetition of, so as *safely* to constitute a

general rule, carry the most convincing, and decisive proof of their existence ; and, indeed, produce a series of symptoms, by far the most severe, and distressing, that are to be met with, in the whole of the diseases to which the human body is liable. In this respect, vaccination is totally without all pretensions. It really has no other phenomena, but what belongs to the vesicle ; and, in these respects, has a striking resemblance to what we see produced, by the introduction of many other fluids *.

But again, there are many circumstances which distinctly prove, that, after the system has been once constitutionally affected, it is neither so apt to be influenced by a repetition of the same cause, nor, if it should recur, to the same severity

* This is clearly demonstrated from the difference we have already seen in successive inoculations, betwixt the effect of the vaccine fluid, and variolous virus ; for, in the one, you can seldom, or never, reproduce a characteristic pustule, while in vaccination, it is generally acknowledged, that you may have the vaccine vesicle, either casually, or otherwise, repeatedly.

and extent. The history and phenomena of scarlatina, cynanche maligna, pestes, dysentery, yellow-fever, and other diseases of climate, and, I believe, we may add every fever produced from contagion, clearly shew, that they by no means recur, whenever the individual is again exposed to the same cause, but give, in all cases, a temporary security, and, in general, render a second attack comparatively mild. Indeed, there seems to be a general principle in the laws of the human œconomy, that, after it has been influenced by any power, it is, for some time, exempted not only from a repetition of its effects, but also from those of any other cause; and the distance seems, in general, to bear a proportion to the severity, and extent of the power previously exerted. This, too, is farther confirmed by the well-known fact, that, in all the cases of a second attack of any of the exanthemata, they are uniformly the consequence of

being exposed to a long continued application, and an increased severity in the powers of the epidemic.

We are here again naturally led to inquire, if there can possibly be any grounds for supposing that casual vaccination possesses any greater powers of influencing the system, than that by inoculation. In our inquiries upon this subject, we have already seen, that Dr Jenner, and all his followers, contend for no such difference, and allow them equally to possess the antivariolous quality. Indeed, the Doctor's history of the discovery, seems clearly to shew that they are exactly the same, for there, the same contradiction of the phenomena, and the same occurrence of small-pox takes place; but it is to be particularly observed, that several cases are given where they resisted inoculation, and exposure to the epidemic, even twenty and thirty years after having the cow-pox. With regard to this fact, it is

to be observed, that such cases were certainly rare, and I must suppose, *anxiously* inquired after, by Dr Jenner, to satisfy himself of the truth of his ideas. Also, it is to be remarked, that before a person can be fit for the office of a milker, he must at least, be sixteen or eighteen years of age, and that thereby, an opportunity has been afforded, for being infected with small-pox, which he might have caught in a very mild way, and have been imperceptible to the mother *; or they might have been those instances of peculiarities of constitution, which we frequently meet with, resisting the small-pox, and of which, there are one or two in the present volume; for certainly it is not supposing too much, that perhaps a hundred of such description, might, upon a diligent inquiry, be found in the *county* of Gloucester. The Doctor's instances, of

* Here the Doctor's cases are faulty, as they do not notice whether or not the small-pox had been subsequently in the family, or that an opportunity had been afforded for communicating the disease.

this description, to the best of my recollection, did not exceed a dozen, where he submitted them to the test of inoculation; and even, all the well authenticated instances he could collect, did not exceed a hundred *, where the casual disease resisted small-pox; notwithstanding, the cow-pox is allowed to be a very frequent occurrence in that county. In addition to all this, we may observe, that there is neither difficulty, nor improbability, in such persons having their constitutions constantly charged with the antivariolous power of vaccination; for, as according to the Doctor, they may take the disease in its most characteristic form, over and over again; therefore, by continuing exposed to be infected, they may be readily found in a state of resistance to the variolous influence, and still its powers *only* temporary.

* I should have thought, that these were rather a scanty number, to build such a fabric upon; especially, too, when so much was at stake.

We cannot dismiss this part of our subject, without noticing the arbitrary opinion of Mr Moore; he says, "he would more easily believe that an able physician should commit a mistake, or disguise one, than that such an incongruity should occur, as small-pox succeeding to perfect vaccination." This gentleman was the author of a tract, entitled, "A Reply to the Antivaccinists," where, amongst many other interesting remarks, we meet with some valuable observations on the nature of medical evidence, with which we entirely coincide; but it affords another proof of the melancholy effect of system, that the very individual who can make such observations, shall avowedly stand forth a desperate instance of their truth and justice, and candidly confess, that he will reject every proof, however much the appearance of truth it may possess. To such a determined dogmatist, we have, therefore, nothing to offer that can possibly be expected

to have any influence ; but nevertheless, we do not despair of seeing him under the necessity of confessing the justness of his remarks, as applicable to himself.

III.—*That the number of Cases where Small-pox have succeeded Vaccination, are not more numerous than those, where Small-pox have recurred a second time.*

This assertion, I apprehend, will appear totally incorrect. It has been elsewhere noticed, that all the instances the vaccinists, with the most *diligent* inquiry, have been able to collect, have not much exceeded twenty cases ; and this too, although the natural small-pox have been known in this country, for nearly a thousand years, and inoculation almost a century, and many of these cases too, accompanied only with such evidence, as the vaccinists would either *readily* reject, or *contrive* some means of defeating, were it brought forward in support

of cases where small-pox have occurred after vaccination.

When we compare this statement with those which have already made their appearance, where instances of small-pox have occurred after vaccination, we shall have little room for doubt upon the question. In the first place, it is to be remarked, that vaccination has only existed, to any extent, about eight years; and that, although a prodigious number have gone through the disease, yet still it bears no comparison with the extent of the natural small-pox, and the practice of inoculation. The difference of the length of the periods, too, constitutes a material point; for in the former, ample time has been allowed for the occurrence of every circumstance which could possibly be favourable for the repetition of the disease; whereas, in the other, time has hardly been afforded for proving its perfect antivariolous power, in any other way, than by imme-

diate inoculation, and exposure to the epidemic, which, we have already shewn, are not to be depended upon. It is well known, too, that small-pox only occurs as an epidemic, every three or four years, and therefore, as it is proved that vaccination, in a great measure, shields the constitution for an equal period, time has only been afforded to put its antivariolous powers once to the test.

When to these material considerations we add, that the Royal College of Physicians, and the Royal Jennerian Society, in London, admit, that cases of small-pox have occurred, where sufficient proof has existed of the most perfect vaccination, and that the report of the Royal College of Surgeons allows of fifty-six, resting upon the best authority.

To these statements, of such respectable public bodies, we have to add those cases given by Drs Jenner, Willan *, Ring, and

* In Dr Willan's publication alone, he has collected, from

other professed advocates of the practice ; those brought forward by the opposers of vaccination ; those stated by Dr Adams, (who, I may here observe, seems to have conducted himself in this business with much circumspection) ; the cases related by Mr Bryce, and those which are now before us ; such an accumulation of proof is afforded, as not only to abolish all parallel betwixt the two diseases in this respect, but to point out, in the most striking manner, the *temporary* and *feeble* protection afforded by vaccination, against variolous contagion.

It is here not possible to avoid the re-

different authorities, upwards of sixty cases, where small-pox occurred after vaccination, in the natural form, besides the terms some and several, which different practitioners heard of. From all which, and the cases occurring from inoculating with variolous virus, the Doctor is obliged to admit, that they were cases of small-pox after vaccination, but endeavours to render them of little consequence, and save the credit of the vaccine practice, by allowing an imperfect and modified action of the vaccine virus,

mark, that there are evidence sufficient to create the strongest suspicion of the most unwarrantable, and uncandid suppression of facts, and that every thing has either been kept out of the way, or mutilated, misrepresented, and depreciated, which could possibly lead to any conclusion, injurious to vaccination. In my humble opinion, it would certainly have been more consistent with the character of the Royal College of Surgeons, and the Royal Jennerian Society, as well as with the attainment of truth, to have published the whole of the cases in their possession, or, at least, mentioned their total amount, and characterized those circumstances, which, in *their* opinion, rendered them suspicious and doubtful; thereby affording a full and fair opportunity for the investigation of the subject.

If I am not much mistaken, it will soon appear, that this *misguided* zeal has been highly injurious to the interests of society,

and is more reprehensible than the most violent opposition of its most determined opponents. I am also convinced, from what has passed under my own observation, for these last three or four years, that we have been *all* guilty of rejecting evidence that deserved more attention, in consequence of the strong prepossessions which existed, from the very persuasive proof of its resisting inoculation, and exposure to the epidemic, and from our judgment being goaded, and overpowered, with the *positive* and *arbitrary* opinions of its abettors. I am now perfectly satisfied, from my mind being under the influence of prejudice, and blind to the impression of the fairest evidence, that the last time the small-pox were prevalent, I rejected, and explained away many cases, which were entitled to the most serious attention, and showed myself as *violent*, and *unreasonable* a partisan as any of my brethren, in propagating a practice, which I have now

but little do but, we must, ere long, surrender at discretion. I cannot but believe, that the same facts; and observations, must have occurred to most of the profession who are engaged in an extensive practice. They have, I am afraid, like myself, shut their eyes against the fairest proof, and endeavoured to resist, when no longer tenable. I hope, and trust, however, they will no more be influenced, and prejudiced by what is too often considered, superior authority; but, being fully aware of the great importance of the subject, to the tenderest feelings of the community, they will speedily, and candidly, bring forward every case, and fact, which can possibly bear upon the subject, and either rescue the practice from doubt and contradiction, or produce its complete annihilation.

IV. It only remains for us to notice the last, and most *feeble* shift to defend the practice, i. e. *that if such cases do occur, they are al-*

ways mild ; and, on the contrary, where small-pox take place a second time, they are always severe *. It seems hardly necessary to oppose such a defence. We have already seen, that, according to the distance of time from vaccination and the concentrated state of the epidemic, the disease approaches more and more, to the common form of distinct small-pox, and, in many cases, to such an extent of pustules, as not to be destitute of danger.

If this was the case when only a few were six years vaccinated, what may not be the consequence at the distance of twenty, or thirty? The idea is dreadful, and distressing, and requires the most speedy attention, and relief; for it is but fair to conclude, that they may be liable

* It is really curious to observe the anxiety, and eagerness with which the vaccinists catch at every little relief the practice of inoculation affords. How far they have succeeded in such appeals, I may safely leave to the judgment of every practitioner.

to the most severe, and distressing form of the disease, and exposed to its worst termination. I apprehend, too, that the statement of such recurrence of small-pox being always severe, is by no means evident, for the deaths do not even amount to the average of the most common form of the epidemic, and both their recurrence, and severity seem, from their history, entirely to depend upon the extent, and virulence of the contagion; and, at all events, the instances are confessedly so rare, that it is impossible to found upon them, any general conclusions.

We cannot conclude our present inquiry, without noticing that very able, and ingenious article on this subject, contained in the seventeenth number of the Edinburgh Review. In addition to what we have already said, as obviating many of the arguments there brought forward, we have to observe, that the objection which is there

started, of the same opposition being made to the introduction of inoculation, cannot here apply. In the case of inoculation, it immediately arose upon the commencement of the practice, and was entirely produced from the theoretical opinions of medical men, concerning the nature of inoculation itself, or from prejudices produced by religion, and the novelty of the practice. Here, however, the opposition still continues, although a number of years have elapsed, sufficient to have elucidated, and confirmed the discovery, and the disease is to be obviated by an expedient totally different, and which has no analogy in nature. We have also a total change of its principles, and effects, since its introduction; a more violent contradiction, and flagrant opposition in the opinion of the most zealous abettors of the practice, and, above all, a daily increase of cases, where small-pox have succeeded to vaccination. We must

also take the liberty to remark, that the article is written by a gentleman, professedly not of the medical profession, therefore he could not, from his own experience, detect what was false, ascertain what was doubtful, or correct what was erroneous; and his judgment depended entirely upon what was brought forward by both parties. There can be no doubt, that his conclusions are just, if his premises were correct; but I hope, as he candidly confesses, that the practice must stand, or fall, by the number of instances, where it has failed in resisting small-pox, he will think the proof here brought forward, sufficient to arrest the attention, and damp the ardour of the most determined vaccinist.

CHAP. IX.

CONCLUSION.

IT now only remains we should notice the assertion, that the complete annihilation of small-pox, must be the consequence of the universal adoption of the practice of vaccination.

It must be confessed, the accounts from many parts of Europe, nay, indeed, from all quarters of the world, give countenance to this opinion, and distinctly shew, that hitherto, wherever vaccination has been introduced, the small-pox have uniformly diminished in severity, and extent, so as, in many parts, almost totally to banish the variolous affection.

Although I am ready to allow these accounts to be so far agreeable, and evidently demonstrating the practice to possess an antivariolous power, I still contend those flattering testimonials may all be obtained, and yet the antivariolous powers of vaccination to be only temporary*.

After what has been already offered, I apprehend it is quite superfluous to enlarge much upon this part of the subject. It appears to me impossible to conceive, that we *can*, or *ought*, to place the smallest confidence in any power, being able to extirpate, or extinguish a disease, which it has not influence to prevent. We may, how-

* Here we may, by the way, remark, that this universality of the effects of vaccination, in subduing the variolous contagion upon the Continent, affords one of the most decisive, and irresistible proofs, that there is neither mystery, difficulty, nor uncertainty in conducting the practice; for it surely would be most unreasonable to contend, that the rest of Europe, possesses members in the profession, of superior abilities, or, that they have better opportunities of being supplied with virus.

ever, observe, that in all, or most of those situations, from whence such favourable accounts have been received, the practice may be said, in point of experience, to be only in its infancy, and, at all events, is quite incompetent to decide this question, as it does not exceed four or five years, since its first introduction. Sufficient time, therefore, has not been afforded, to put its permanent powers to the test; for we have already seen, that in general, vaccination secures the constitution from the variolous influence, to the extent of three, or four years; and we also know, that small-pox only make their appearance, as an epidemic, at the interval of some years. It is also to be particularly remarked, that the same consequences were found to result from the practice, for the first few years in this country; but in London, and other large cities, when vaccination was first introduced, and practised to a great extent,

small-pox have returned with increased severity.

But it is to be farther observed, that the great number of instances where small-pox have occurred after vaccination, have been for some years past so frequent, as nearly to check the further progress of the discovery, and, in every situation in this country, where the vaccine practice had been employed to any extent, and the inhabitants numerous, an increase in the number of cases have regularly occurred upon every appearance of the epidemic small-pox. I can also with truth declare, that the cases given in the present volume, do not exceed one half of what I have met with; many I rejected, and explained away some years ago; others I received information of, too late for sufficiently authenticating the cases, and several I have not now inserted, as they appeared unnecessary and superfluous. When, to these circumstances, which, I dare

say, are applicable to every practitioner, we shall add the general mildness of such cases; the accidental manner in which we were made acquainted with many of them; and that parents of the lower classes of society, do not consult the medical profession, even in severe cases of small-pox, it is evident, many more must have either passed unobserved, or have been considered as undeserving of attention. Indeed, I do think I am below the truth, when I say, that in this quarter alone, upwards of two hundred such instances must have already occurred*.

If this has been the consequence of the appearance of the epidemic small-pox in this neighbourhood, it is but fair to conclude, that it must also have been the case, wherever the disease has made its appearance, more especially, as such cases have already occurred, in every situation, where vaccina-

* In London, the occurrence of small-pox after vaccination have been for some years so frequent, as to check the farther progress of the discovery in the city and environs.

tion had been practised to any extent, and that they must either have escaped observation from the causes I have already stated, have been anxiously suppressed, or considered, from their mildness, as forming no great objection to the practice. Within these few weeks, however, I have received such accounts from Edinburgh, Dalkeith, Haddington, Dunbar, Berwick, Alnwick, and several other places * where the small-pox

* I have, within these few days, had an opportunity to peruse a letter from Dunkeld, from one who lost a son eleven years of age, from small-pox occurring about six years after vaccination. It stated, that the small-pox had been raging there for some months; that twenty-six cases had already occurred, where small-pox succeeded to vaccination, three of whom died; and that six had fallen a sacrifice to the epidemic, where no vaccination had been employed. I may here also observe, that I am acquainted with two or three cases, where the occurrence of small-pox have been attended with fatal effects. I must, however, observe, that, in all of them, some objections seem to have been started by the practitioners, but there appeared not a little confusion about the important point, whether or not these objections were only made, *after* the occurrence of the small-pox. The history of vaccination, also, affords many instances of deaths occurring under such circumstances, and shew the pressing necessity for adopting decisive measures, either to acquire some definite ideas of the practice, or to relinquish it entirely.

have been, or are still prevalent, of the frequent occurrence of such cases, that it is not going too far to say, that *many thousands* of instances must have already occurred in this island. When, to all this, we shall add, our total ignorance of the nature and source of the small-pox contagion; its virulence, its activity, its ancient, extensive, and dreadful effects; it is impossible to suppose for a moment, that any power which only possesses the property of an imperfect, and temporary antidote, can be trusted to, for subduing, and extinguishing, such a dangerous, and universal disease.

I have now brought to a conclusion, those observations, which the state of the practice of vaccination, together with the cases here brought forward, naturally suggested to my apprehension. It is, perhaps, too much to assert, that they are decisive and convincing; but certainly I may be allowed to say, they not only seem entitled to attention, but

are sufficient to shake our confidence in the efficacy of the practice. They seem also to prove, that the whole subject requires the most serious investigation, and that the powers of vaccination are feeble and temporary.

If this is the result of our inquiry, it very naturally occurs to be demanded, what is the most prudent conduct to follow, under such circumstances? Shall we continue to carry on, and advise the practice of vaccination, at all hazards? or shall we return to the old practice of inoculation?

I apprehend, it is impossible with a safe conscience, or with a mind alive to all the disasters and distress which may ensue, to disregard the danger which the dearest concerns of the public are exposed to; and it must bring indelible disgrace upon the whole medical profession, to be detected and exposed, *only* by the most glaring confusion, and the most disastrous facts.

We have shewn, from an attentive examination of the history of the affection, that its source is involved in mystery ; that the origin of the practice is loaded with contradiction ; that it is incapable of influencing the system, in a regular or positive manner ; that many of the phenomena of the disease, resemble those produced from matter, possessing no specific influence ; that in general its effects, so far as they can be observed, are merely local ; that no one certain criterion exists, of the attainment of constitutional vaccination ; in short, there is not one circumstance belonging to the subject, void of confusion, uncertainty, and contradiction. But when, to this terrific, and disgusting chaos, we add, the positive proof of the frequent and regular occurrence of small-pox, succeeding to vaccination, I apprehend, little room is left for hesitation. It would surely be most unreasonable to expect, that the public should continue their

patronage, under such glaring inconsistency, and such positive testimony of its defects. It would certainly be most absurd to suppose, that they would still follow a practice, where they must be assured, their tenderest concerns must be exposed to sickness and distress, however safe the result might be; but it would undoubtedly be downright madness, to imagine they will condescend to encourage it, when it appears they may undergo the disease, in its most distressing and dangerous form *. In the present state of

* As an argument in favour of continuing to adopt the practice of vaccination, in preference to inoculation, Dr Willan supposes, that only one case in eight hundred has occurred, where small-pox have succeeded to vaccination, including mistakes, negligences, and mistatements, and therefore puts the question, that if one in a thousand should take the small-pox, would the utility of vaccination be invalidated? and concludes, surely not. Were this proportion even the fact, it would be perhaps sufficient to damp our ardour, in propagating the disease; for although this occurrence should be as rare as deaths, from the practice of inoculation, yet, as the practice of vaccination is only in its infancy, and time has not elapsed, to fix, neither the proportion, nor se-

things, I apprehend, inoculation is both what we should recommend, and they should adopt. It is a practice, possessing the most satisfactory characters; it is propagated from the same disease it means to combat; produces an affection in all respects

verity of the cases, many would hesitate in subjecting themselves to such a precarious security, and would rather submit to adopt a practice, although attended with a positive risk, than exist in a state of apprehension.

But, from the statements contained in this work, and more especially, respecting the village of Duddingston, it appears, that this is out of all proportion; for there, the cases where small-pox succeeded vaccination, were as one in three. We have also seen, that in the parish of Inveresk, upon a moderate calculation, two hundred cases have also occurred. Supposing therefore (which I believe to be near the truth,) that 2500 have been vaccinated, it will give upwards of six in the hundred. But as we have seen, that those cases where small-pox have occurred, are, in general, at the distance of four years from vaccination, we must therefore reduce the number vaccinated to one half, which will then make the number nearly thirteen in a hundred, or about one in eight. If we apply this rule to the Duddingston cases, and thus cut off those who were vaccinated by Mr Gillespie, we will then find, that nearly the whole who, from the period of vaccination, were in a state to be influenced by the variolous contagion, underwent the small-pox.

similar ; its progress and effects are certain, and uniform ; it is in general, mild and safe, and its consequences are complete, and satisfactory.

From the brief view we have already presented of the state of inoculation, previous to the introduction of vaccination, it appeared, that although the practice was exposed to the fancy and whim of individuals, and that many circumstances were omitted in conducting the process, which were entitled to the greatest attention, yet still, only one in five hundred fell a sacrifice to, or was otherwise injured from the practice. If this was the state of inoculation, with all its disadvantages, what have we not reason to expect, if the same attention and patronage were bestowed, as have been afforded to the practice of vaccination, and every improvement made, which the subject is capable of. I have not the smallest doubt, that the number of deaths might be

made, either entirely to disappear, or, at all events, to occur so rarely, as to form no objection to the practice ; but also, a more decisive and effectual method would be obtained, of eradicating, and destroying, the baneful effects of the epidemic disease.

It is impossible that the objection, of inoculation always affording a constant source of infection, can be allowed any weight. This ought only to be considered as a spur for rendering the practice universal ; for it surely can neither be required, nor expected, that any individual should continue to adopt a practice, merely because it may *at present* prevent the spreading of small-pox, without being satisfied, that it will either *effectually* secure themselves, or *ultimately* subdue the variolous contagion. It might, with equal justice, be expected, that we should deny ourselves every opportunity of improvement, or refuse to take advantage of favourable events,

merely because they either are not perceived, or are disregarded by others.

There still remains one very important, and highly interesting point, upon which it may be necessary to make a few observations. Those who have hitherto adopted the practice of vaccination, must certainly be placed in a most painful, and distressing situation, and feel extremely anxious to know, what is the best plan for satisfying themselves of the security, and ultimate safety of those, who have submitted to vaccination.

From the view we have taken of the subject, and the facts we have submitted, I apprehend, until the whole undergo a thorough investigation, few practitioners will be so bold as to advise, and few individuals will be so blind as to place, an indiscriminate, and unlimited confidence in its effects. We would, therefore, recommend, that not only all those who have been simply vaccinated,

but also, all who were submitted to the tests of inoculation, and exposure to the epidemic at an early period, should undergo a second inoculation with variolous virus.

The reasons for including those who were formerly either inoculated, or exposed to the variolous contagion at an early period, have been already explained ; but it may be here observed, that, as these tests were employed at a time when they neither did, nor, it appears, could be expected to produce any constitutional influence, and when inoculation was merely attended with an inflamed point, or tumor, without being accompanied *either* with an areola, or constitutional derangement, these tests cannot be considered as giving any farther security, and are merely a proof of the antivariolous influence of vaccination having been, at the *time* exerted. But when we see, that, upon inoculation being employed at a greater distance from the period of vaccination, it

gradually assumes both the appearance, and effects, of the primary variolous inoculated pustule, in exact proportion to the distance from vaccination, and that these phenomena also exactly correspond, comparatively, with the influence of the variolous epidemic, we *must* conclude, that some change has taken place, favourable to the production of small-pox. We have also seen, that this period of security seems, in general, only to extend to the distance of three or four years after vaccination, if the individual is exposed to the epidemic contagion; but if the infection is introduced in the form of inoculation, it in general requires a distance, at least, of five years from vaccination, before you can produce either an areola, or constitutional symptoms.

Although, for the reasons already given, I consider the areola as a decisive test of a constitutional effect, yet, as we have strong reasons for supposing, that a specific action

may exist *minus* in the constitution, I would rather recommend waiting until a distinct constitutional effect can be obtained, which, I am inclined to think, will be found pretty uniformly to follow, about the sixth year from vaccination*.

Although I have not hitherto met with any cases where small-pox have occurred, after undergoing the test of inoculation, yet I am not the less satisfied of the truth of this opinion; because, as I have already observed, hardly one instance has yet occurred, where small-pox have succeeded to vaccination, in the higher and respectable classes of society, and it was chiefly amongst these, that the test of inoculation was submitted to; and also, from the appearances

* At this period, there seems every reason to conclude, that you will not only obtain the areola, and satisfactory constitutional symptoms, from repeating the inoculation with variolous virus, but also, that still the effect of vaccination exists to such a degree, as to give the certainty of a *safe* result.

which have taken place in such as have been again submitted to the test of inoculation, at the distance of two or three years, after having undergone the first test, when we find pustules and areolæ can be produced, although they had not been obtained in the first instance*.

* Dr Stanger, physician to the Foundling Hospital, states to Dr Willan, that "thirty-five children, vaccinated between the 30th March 1801 and the end of May 1802, were inoculated with recent variolous matter, on the 9th of August 1802. In *most* of these cases, the puncture presently healed; in *some*, slight inflammation was produced; and in *three* or *four* of the cases, there appeared a small acuminate pustule, which, after some days, was succeeded by a slight scab, no constitutional disorder having intervened.

"In November 1804, twenty-one of the children vaccinated in 1801, and afterwards variolated in 1802, were a second time inoculated with matter taken from a child, labouring under the natural small-pox. The result of this trial, made three years and a half after vaccination, confirmed its preventative power. The only effects produced, were slight inflammation, produced about the puncture in *some* cases, and in a *few* others, a small local pustule, which soon disappeared."

Now, I apprehend, from this description, although a very imperfect one, it clearly appears, that what I have elsewhere contended for, is strikingly corroborated; for in those inoculations, which included only periods of some months, to

Indeed, it is in these circles of society, that the great danger of the practice seems to lie ; for, as I have elsewhere observed,

that of twelve, only a very trifling effect, such as I have already described, was produced ; but when it came to be repeated, at the distance of two or three years, not only did the previous inoculation afford no additional obstruction to the progress of the second inoculation, but now a greater inflammation, and even pustules were produced ; distinctly shewing, that the immunity from small-pox was much weakened, by the increased distance from vaccination. But there is a case, which occurred to a Mr Kendrick, a practitioner at Warrington, which appears to me to decide this point.—“ S. C. aged nine months, was vaccinated in February 1800. Mr Kendrick saw the child on the ninth day. The vesicle was of the usual form, depressed in the centre, and elevated at the circumference. The areola was fully formed, and the mother thought the child appeared a little feverish during the night. On the 10th of June following, this child was inoculated with variolous virus. On the fourth day, the arm was a little inflamed round the puncture ; fifth day, the inflammation a little increased ; sixth, the inflammation still increasing, and a small quantity of pus formed ; seventh day, inflammation decreasing ; ninth day, inflammation nearly gone. No fever or eruption ever appeared. On the January following, the small-pox raged, with great violence, in that part of the town where the child lived, and she was then repeatedly, and fully exposed to the infection. On the 14th of that month, Mr Kendrick was requested to see the child,

they are more excluded from exposure to the epidemic, by which they may avoid its effects, while the antivariolous power is yet capable of mitigating the disease, and in their progress through life, may be exposed to, and infected with the variolous contagion, when all the influence of vaccination is exhausted, and left completely at the mercy of the epidemic.

Before closing the subject, we shall subjoin a few quotations from different authorities, which will distinctly shew the state of the practice, even in the opinion of its most zealous abettors.

The following are extracts from a letter of Dr Jenner's to Dr Willan, dated only on the 23d February 1806 :

in consequence of an eruption having appeared upon it. He was informed, that, on the ninth and tenth, the child had been extremely feverish, and that, on the evening of the tenth, an eruption had appeared on different parts of the body, resembling the distinct small-pox. The pustules had continued to increase, and were then increasing, and did not fully mature until the eighteenth."

In answer to the question from Dr Willan,—what are the changes produced in the vesicle, when a person is affected with the shingles, vesicular ring-worm, or impetigo*? Dr Jenner observes, “ they usually produce a striking deviation from the character of the vaccine pustule, at some period or another of its progress, but more frequently in its early than in its declining stages ; indeed, it is commonly perceptible in *a day or two* after inoculation (vaccination). It would be difficult, perhaps impossible, without the aid of drawings, to give a correct description of the varieties, which an herpetic state of the skin is ca-

* Dr Willan observes, that “ the cutaneous diseases which sometimes impede the formation of the genuine vaccine vesicle, are herpes, (including the shingles and vesicular ring-worm.), the dry and humid tetter, and the lichen, but especially the porrigo (or tinea), comprising the varieties denominated crusta lactea, area, achores, and favi, all of which are contagious. To these perhaps should be added, the itch and prurigo.”

pable of producing, from those trifling deviations which prove no impediment to the vaccine security, up to that point of imperfection in the pustule, which affords no security at all. In saying no security at all, perhaps I commit an error; for it *strikes* me, that the constitution loses its susceptibility of small-pox contagion, and its capability of producing the disease in its perfect and ordinary state, in proportion to the *degree* of perfection, which the vaccine pustule has put on in its progress; and that the small-pox, if taken subsequently, is *modified* accordingly. When no deviation takes place in the ordinary course of the vaccine pustules, or when it is inconsiderable, the herpetic blotches or vesicles, of whatever kind they may be, often assume (sometimes as early as the *third* or *fourth* day * after the

* It would be easy to shew, that this is not only quite contrary to general experience on the subject, either of vaccination, or inoculation, but is also completely impossible to be effected, by the vaccine puncture, at the period mentioned.

insertion of the vaccine fluid) a new character, not unlike the vaccine, and keeping pace, in their progress, with the pustules on the arm, die away with them, leaving the skin smooth.

“ What appearances the variolated arm puts on when the skin is affected with irritative eruptions, I have *not* an opportunity of ascertaining.

“ That the small-pox inoculation, like the cow-pox, sometimes fails when the skin is at the same time diseased, I have *abundant* facts before me to prove*.

* The two last paragraphs follow each other in the letter almost in close succession, and to me appear in downright opposition to each other, although perhaps *Dr Jenner* may be able to reconcile them. I must however remark, that it betrays an anxiety to support vaccination at the expence of inoculation, and indeed we have seen, that wherever vaccination appeared deficient, relief was uniformly sought from comparing it with inoculation. With what truth, we have already endeavoured to shew in many instances, but here I apprehend there are less grounds than ever; and it clearly points out the anxiety and feelings of the vaccinists themselves on the subject. Every practitioner of even moderate

“ I have often been astonished at seeing how *small*, and apparently how *trifling*, a local affection of any part of the skin, is capable of occasioning derangements in its action in parts at a distance, although its disordered state be of such a nature, as not to be *discernible by the eye*. For example ;

experience, either in inoculation, or the epidemie disease of small-pox, must know, that no such obstacle or modification is opposed by any cutaneous disease whatever ; that, on the contrary, these diseased states of the surface are not an uncommon cause, of a severe fever, and numerous eruption ; that wherever those cutaneous affections exist, there, in general, the number of small-pox are most numerous. For my own part I can declare, that I have seen the small-pox (whether from inoculation, or the epidemie,) exist in every cutaneous affection, from the most severe itch, to the most trifling herpetic affection, and that, so far from these affording any obstruction to the regular progress of the variolous affection, those diseases, on the contrary, were either entirely cured, or underwent a very material change, and improvement. But when we attend to what the Doctor states in the following paragraph, quoted above, the two affections not only lose all similarity, but vaccination is absolutely exposed to ridicule, and contempt, and the profession run some risk of being charged with corruption, for seriously recommending, and enforcing, so weak, so trifling, and so uncertain a disease, as a preventative of the severe, dangerous, and extensive affection of small-pox.

a *small* excoriation behind the ear—*two or three* vesicles, even though of *catarrhal* origin, on the lips, or about the nostrils—a *few* scurfy spots on any part of the body—and even those vesicles, and the subsequent state of the skin, that are produced by *external* injury, (as I lately witnessed on vaccinating a boy whose face was injured by the explosion of gunpowder), appear as *capable* of producing irregularity in the progress of the vaccine vesicle, as more extensive cuticular affections. Vaccination, when these maladies are present, seems to shew, that the whole surface of the skin is influenced at the same time, but in *separate* portions; for on *one* arm I often produce a perfect vaccine pock, and on the *other*, from the insertion of a portion of the *same* virus, one that is *imperfect*, and which would afford *no* security. Indeed, on the *same* arm, within the space of an *inch* from each other, there will often be this difference in the appear-

ance of the pocks—one putting on the *perfect* character, and the other deviating so widely, as to resemble more nearly that of an *herpetic* vesicle, accompanied with inflammation, and commonly ending in a soft, amber-coloured, or blackish scab—and sometimes, especially if it be much disturbed by scratching, in ulceration: The probability then is, that the skin, at the *point* of insertion, is sound and in its natural state in the *one* instance, and diseased in the *other*, but not so, as I have before observed, as to be *perceptible* to the eye.”

Besides the extracts we have already made from Dr Willan’s treatise on this subject, we shall now add the following :

“ Whilst we acknowledge that some who had been vaccinated in the preceding years, took the small-pox at this period, we have reason to congratulate ourselves that the number was so small, and that so few mis-

takes had been committed in a mode of practice entirely new.

“ Several of those anomalies, or exceptions to the general rule have occurred, but certainly not so often as was expected by those who considered the subject, from the first, dispassionately, nor have they been in sufficient number, to form any serious objection to the practice, founded on Dr Jenner’s discovery*.

* In Dr Willan’s collection of evidence, we meet with the following letter from Dr Cassells to Dr Binns: “ I have vaccinated above fifty children, one of which has, since gone through the small-pox caught by infection. When this child was inoculated for cow-pox, I had no reason to think it did not undergo the regular process of vaccination; at the same time I will not assert that the disease was genuine. I profess myself a friend to vaccination, although it should in some instances be succeeded by small-pox, because I think it is clearly proved, that the vaccine poison, when absorbed into the human system, has the power of rendering the poison of small-pox completely inert for *some* years, and farther experience *may* prove, that it will ultimately resist the action of variolous contagion. In my judgment, experience has *not* proved that vaccination has triumphed over variolation, as many unsuccessful cases have been, from time to time, published from the minutes of the vaccine-pox institution, some of which I think impossible to disprove, particularly that of

“ The too zealous, and enthusiastic advocates for the new inoculation, who extended their views far beyond the limits of analogy or probability, have done no service to the cause.

“ Imperfect vaccination, is not characterized by any uniform sign, or criterion, but exhibits, in different cases, very different appearances, as pustules, ulcerations, or vesicles of an irregular form. Inoculators are now generally acquainted with these appearances, but the chief nicety, and difficulty of vaccination is, in distinguishing from the genuine vesicle, some irregular vesicles, which have *often* been mistaken for it, and which do not *wholly* secure the constitution from the small-pox.

“ Since the vaccine virus, compared with that of the small-pox, appears to be more

Sarah Waglin, by Dr Woodforde of Ansford, and William Rodman, by Mr Lawrey ; the former caught the casual cow-pox fourteen years ago, the latter fifteen years ago, and both have lately gone through the process of natural small-pox.”

delicate, and more liable to *degenerate*, or to *fail* in its operation from various causes, several practitioners are of opinion, that the *variolous* is preferable to the vaccine inoculation, and that it may be conducted with equal safety. I need not at present recapitulate the advantages of vaccine inoculation, which thousands have attested. The salutary effects of this practice, under the proper regulations, being fully established, *should we now* desist from it, because it is found to require greater *nicety* and *attention* than many persons at first believed necessary? A very different conclusion ought surely to be drawn from failures, which were not so much the effects of accident, mistake, or oversight in the early inoculators, as of inexperience in the business they had undertaken. The right inference, from the mistakes or failures above stated, and from the *nicety* of vaccine inoculation, is, that only those should be inoculators, who

have had a sufficient *education*, and who have *particularly* attended to the subject of vaccination *.

* Let us contrast this with the opinion of Dr Adams, who, it must be recollected, is physician to the Inoculation Hospital in London, and is also a friend to the practice of vaccination. He observes, "Another and much more important objection against vaccination has been drawn from the uncertainty of the process. It must be confessed, that the friends of vaccination have been *much* too forward in accounting for supposed failures, by the imputation of an *improper*, or, as *they* often call it, an *ignorant* mode of conducting vaccination.

"That vaccination, like every thing else, requires certain instructions, cannot be questioned. The disease is, however, so *uniform* in its appearance, and so *regular* in its progress, as to be described with *more* certainty, and consequently liable to *fewer* errors, than *any* other with which we are acquainted."

The Doctor, too, in answer to a letter from Dr Hervey, addressed to him by desire of the College of Physicians, writes thus: "Besides the *prudent* backwardness of most in admitting novelties into practice, without ample proof of their utility, the causes which have prevented the general adoption of vaccination appear to me to have been, principally, the *mistaken* zeal of its *friends*. It could not be expected that men, who value themselves on their talents at investigation, and feel conscious of their scrupulous adherence to truth, could patiently submit to be uncandidly treated for a scepticism, induced by events however accidental. When their accuracy was questioned, whilst they disregarded the assertions of their accusers, they became diligent in

“ By an obvious collateral inference, we must be led to acknowledge the propriety,

collecting collateral evidence, and when their reasoning was ridiculed, instead of expressing only their doubts, they became parties in their own defence.

“ Another inconvenience has arisen from a *too great forwardness* at answering objections, before they were sufficiently matured ; hence, when variola appeared after vaccination, the event was *either denied, or explained* by so many *minute* causes, as were sufficient to *frighten the ignorant, disgust the candid, and induce the prudent* to avoid an experiment, the result of which was not sufficiently understood.

“ A practice, at *one time* represented as so simple, that the clergy, and females were invited to undertake it, became at *once so mysterious*, that only a *chosen few* were said to understand vaccination ; every untoward event was imputed to *ignorance between the true and spurious pustule ; to taking matter at too late a period ; and to other causes still less satisfactory.*

“ Had these uncertainties *really* existed, they would have been *sufficient* objections against a practice, the object of which is to secure the subject from a formidable disease, and from which, he might be secured by another, certainly less desirable, but *well ascertained* operation. But the *truth* is, that vaccination is as *simple* as it was at *first* announced ; that the true character of its vesicle is *more certain* than the local effect of any other morbid poison ; that it is impossible to confound it with a pustule of any kind ; and, that every difficulty might have been avoided, by requiring a correct register of the progress, from the period of insertion, to cicatrization, or for the most part, of perfect scabbing.”

of a strict examination of the persons inoculated between the first of January 1799, and the first of January 1802, and the necessity of reinoculation in every doubtful case. In cities, and large towns, where medical practitioners have easy access to their friends and patients, the examination might be performed without much trouble, and, if a little address were employed, without exciting *much alarm*.

“ I wish that practitioners throughout the country would, by revising their primary inoculations with a more *experienced* judgment, take care to ascertain the safety of those who have confided in them, and thus secure their *own peace of mind*; for what would their feelings be, if the small-pox, casually conveyed, should prove *fatal* to any of the persons whom they first persuaded to make trial of the new invention.

“ I shall perhaps be asked, whether I think that the variolous appearances *, in all the cases I have adduced (whether produced from the effects of the variolous contagion, or from the introduction of the variolous virus by inoculation), were the consequences of imperfect vaccination?— There is great difficulty in obtaining clear, and direct information on the subject, scarcely one private practitioner in ten, being able to produce any written note, or memorandum, of the appearances, or effects of the inoculation ; and even in public institutions for gratuitous vaccination, the medical superintendents *often* lose the opportunity of ascertaining whether the inoculation has proceeded rightly or not, because the patients fail to attend at the proper times.

“ When only a local effect is produced by inoculating with variolous matter, the

* Such as fever, rash and eruptions, &c. &c.

constitution will be affected by the small-pox at a future period, as much as if no pustule had been formed *. This has been confirmed by numerous cases, some of which terminated fatally. If, in a few cases, perfect vaccination does not prevent variolous fever and eruption, or inoculation, or exposure to contagion, it will at least place the persons who take the small-pox, in the same state, as those who have been inoculated with vaccine, and variolous matter about the same time, a state which has hitherto been wholly free from danger."

Let us now see what Mr Bryce says, who, it must be recollected, insists upon the perfect and unmodified antivariolous efficacy of vaccination.

* We have already observed, that in many of these cases, no objections nor doubts, appear to have been suggested at the period of vaccination, but seem only to have been brought into view after the occurrence of small-pox.

“ If the affection of cow-pox at the part inoculated has proceeded regularly through all its different stages, and if each stage has been clearly, and distinctly marked, we think ourselves authorised, from the united testimony of many eminent in the medical profession, to conclude, that the general affection, and consequently, the antivariolous process, has taken place in the constitution, even although *no fever* may have been detected *. But in many instances these different stages are not regular, neither are

* Mr Bryce has the following observations on the cases of Nelson's children, “ It seems somewhat extraordinary, however, that the cow-pox affection should have advanced with such regularity, and that, at the *very time* of the eruptive fever of small pox, the marks which have hitherto been regarded as denoting a constitutional affection in cow-pox, viz. the inflamed and hard areola, should also have been in perfection. In these two cases, and in *several* similar ones, which have since fallen under my observation, the constitutional affection from small-pox, must have followed that from the cow-pox in very close succession, or there must have been *two* diseases present, viz. the small-pox as a constitutional disease, and the cow-pox as a mere *local* affection ! !”

they distinctly marked; and *how far* these irregularities may take place without frustrating the purpose of the inoculation, and what may be the *exact* degree of the size of the vesicle, or of the surrounding inflammation and hardness, which is to mark a constitutional affection, or to assure us that the antivariolous process has been accomplished, we *must confess* we have no certain rule, to determine *. On this point, then, as-

* Mr George Bell also says, "All who have had sufficient experience in inoculating for the cow-pox, know, that there is no one certain criterion applicable to every case, by which it can be ascertained that the disease has pervaded the constitution.

"In judging from my own experience, as well as from conversation, and correspondence with others, and the perusal of the best books upon the subject, my opinion is, that that when the cow-pox runs regularly through the stages I have stated, it *never fails* to preserve the patients from the contagion of small-pox. But it *must be confessed*, that some patients have been seized with the natural small-pox, or have received the infection by inoculation, who were *supposed* to have undergone the genuine vaccine disease.

"It is only by the most *minute* attention to every circumstance of the disease, in all its stages, and to the combination and relation which all the appearances bear to each other, that a *decisive* opinion can be formed."

surely, the most important to be ascertained in the progress of the symptoms of cow-pox, every person is left to form his opinion, from a comparison in his own mind of the case under consideration, with what he may have read in the writings of authors, or with what he may have observed in other cases, which, to his own knowledge, had proved effectual. But it will be allowed, that a judgment thus formed must *often* be very inaccurate, and thus bring disappointment, *or worse*, to all concerned, as well as *discredit* upon the inoculation.

“ Since the foregoing pages were put to press; and while yet correcting the proofs of the present, I have had an opportunity of examining two cases, in which the small-pox have appeared, after the children had *apparently* undergone the cow-pox affection.

“ From the very first time that I had occasion to conduct the inoculation for cow-pox; the uncertainty of the desired change

being operated upon the constitution, partly from the apparent slightness of the affection at the part inoculated, but chiefly, from a want of some well-defined mark, whereby to judge of a general affection, very forcibly presented itself to my mind; and, after having carefully attended to upwards of six hundred cases, which have fallen under my immediate care, I am thoroughly convinced, that some clear, and well-defined mark of a constitutional affection in cow-pox, different from what has hitherto been observed by those who have written on this subject, is still to be regarded as the grand desideratum in conducting this new inoculation; for, until this be established, our judgment of the efficacy of the cow-pox inoculation, in preventing small-pox, must often be formed with *doubt and anxiety, and too frequently prove ultimately erroneous.*

“ These distinctions, of spurious cow-pox, and of irregular vesicles, many authors have

endeavoured to establish, and to describe minutely, so as to be easily detected in practice, but, in my opinion, with little success; for we still hear of many instances, in which the practitioner has been deceived in his opinion, concerning the safety of his patient, notwithstanding of the rules prescribed by those authors, for forming an opinion with precision on this point. And the above quotation*, concerning the effects of irregular vesicles on the constitution, shows the distinction made by Dr Willan, to be not only *useless*, but *hurtful* in practice, because, if these irregular vesicles *effectually* secure some constitutions, and only *imperfectly* secure others, how are we to distinguish whether our patient be perfectly or imperfectly protected, and to what degree?

“ These terms, therefore, appear to me to be *contrived*, rather with a view of explaining *something* not understood, than from

* See page 122.

any *correct* observations made on the subject; terms *contrived*, under which the practitioner might *sculk* in case of failure, or mistake; and the more nearly the descriptions of these said spurious and irregular vesicles *are made* to resemble the genuine vesicles, and the greater difficulty there is in distinguishing between them, the more *effectually will this shield and protect those who use it* *.

“ The introduction of the terms, “ spurious cow-pox,” and, “ irregular vesicles producing imperfect vaccination,” have, in my opinion, therefore, done much injury to the true interests of vaccination; and I must here, for my own part, declare, that were I, in my practice of inoculation for the cow-pox, obliged to form my opinion concerning the presence and extent of the constitutional affection, and, consequently, concerning the future safety of my patient, from the description of the affection as given by

* Here, Mr Bryce rises superior to every evasion.

the authors who adopt these terms, such are the doubts which these descriptions would *constantly* create in my mind, that, however much I value this new inoculation, and few can value it more than I do, *I would infinitely rather prefer at once, to inoculate with the small-pox."*

Extracts, to the same purpose, might be readily obtained, sufficient to fill a volume ; but, I apprehend, enough have been given to convince the reader, even, according to the professed advocates of the discovery, not only of the urgent necessity for immediate investigation, before the practice can be farther recommended and adopted, but also, that in fact, there is but a straw-breadth betwixt us, and the moment a feeble and temporary power is admitted, every difficulty vanishes ; we are neither obliged to have recourse to the frivolous, and vexatious distinctions of local, and constitutional, perfect, imperfect, and irregular vesicles ; to the

disgusting necessity of employing tests, for ascertaining the existence of the disease; and above all, to employ the contemptible evasions, of flea-bites and chicken-pox. On the contrary, every thing becomes consistent, harmonious, and intelligible, and the affection appears in such characters, 'as easily to determine, even a very partial observer, what practice to adopt.

I have now discharged what seemed to me an indispensable duty, and I trust, it has appeared, that I have been anxious, rather to address the judgment, than the feelings of my readers. While my own mind acquits me of any improper motives, I shall pay but little attention to the insinuations of others; it surely does not betray a want of candour, honesty, or contempt of self-interest, to contradict the opinions I have uniformly given, and the assertions I have made for nearly nine years, and to render almost

nugatory, twelve hundred cases, for which I have received remuneration. I am only sorry, that the sentiments I at present entertain of the vaccine practice, should *appear* to differ from those of so many of my professional brethren ; but I can conscientiously declare, that it will afford me the highest pleasure to find my apprehensions groundless, and I will receive the greatest satisfaction, if what I have brought forward, shall only be the means of producing an investigation, which shall terminate in fixing vaccination, on an intelligible, efficacious, and practicable basis.

THE END.

Printed by G. Ramsay and Co.
Edinburgh, 1809.



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1847





